

INVENTOR

DRAWER 4 VOCATIONS

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Abraham Lincoln's Vocations

Inventor

Excerpts from newspapers and other
sources

From the files of the
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THE LINCOLN NATIONAL LIFE
FOUNDATION
FORT WAYNE, INDIANA

MOTIVE POWER OF THE WIND

"Of all the forces of nature, I should think the wind contains the largest amount of motive power--that is, power to move things. Take any given space of the earth's surface--for instance, Illinois; and all the power exerted by all the men, and beasts, and running-water, and steam, over and upon it, shall not equal the one hundredth prt of what is exerted by the blowing of the wind over and upon the same space. And yet it has not, so far in the world's history, become proportionably valuable as a motive power. It is applied extensively, and advantageously, to sail-vessels in navigation. Add to this a few wind-mills, and pumps, and you have about all. That, as yet, no very successful mode of controlling, and directing the wind has been discovered; and that, naturally, it moves by fits and starts--now so gently as to scarcely stir a leaf, and now so roughly as to level a forest--doubtless have been the insurmountable difficulties. As yet, the wind is an untamed, and unharnessed force; and quite possibly one of the greatest discoveries hereafter to be made, will be the taming and harnessing of it. That the difficulties of controlling this power are very great is quite evident by the fact that they have already been perceived, and struggled with more than three thousand years; for that power was applied to sail-vessels, at least as early as the time of the prophet Isaiah."

Fragment from Abraham Lincoln's
Lecture on "Discoveries and Inventions"
April 6, 1858

UNITED STATES PATENT OFFICE

ABRAHAM LINCOLN, OF SPRINGFIELD, ILLINOIS.

BUOYING VESSELS OVER SHOALS.

Specification forming part of Letters Patent No. 6,469, dated May 22, 1849; application filed March 10, 1849.

To all whom it may concern:

Be it known that I, Abraham Lincoln, of Springfield, in the County of Sangamon, in the State of Illinois, have invented a new and improved manner of combining adjustable buoyant air chambers with a steamboat or other vessel for the purpose of enabling their draught of water to be readily lessened to enable them to pass over bars, or through shallow water, without discharging their cargoes; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings making a part of this specification. Similar letters indicate like parts in all the figures.

The buoyant chambers A, A, which I employ, are constructed in such a manner that they can be expanded so as to hold a large volume of air when required for use, and can be contracted, into a very small space and safely secured as soon as their services can be dispensed with.

Fig. 1, is a side elevation of a vessel with the buoyant chambers combined therewith, expanded;

Fig. 2, is a transverse section of the same with the buoyant chambers contracted.

Fig. 3, is a longitudinal vertical section through the centre of one of the buoyant chambers, and the box B, for receiving it when contracted, which is secured to the lower guard of the vessel.

The top *g*, and bottom *h*, of each buoyant chamber, is composed of plank or metal, of suitable strength and stiffness, and the flexible sides and ends of the chambers, are composed of india-rubber cloth, or other suitable water-proof fabric, securely united to the edges and ends of the top and bottom of the chambers.

The sides of the chambers may be stayed and supported centrally by a frame *k*, as shown in Fig. 3, or as many stays may be combined with them as may be necessary to give them the requisite fullness and strength when expanded.

The buoyant chambers are suspended and operated as follows: A suitable number of

vertical shafts or spars D, D, are combined with each of the chambers, as represented in Figs. 2 and 3, to wit: The shafts work freely in apertures formed in the upper sides of the chambers, and their lower ends are permanently secured to the under sides of the chambers: The vertical shafts or spars (D, D,) pass up through the top of the boxes B, B, on the lower guards of the vessel, and then through its upper guards, or some other suitable support, to keep them in a vertical position.

The vertical shafts (D, D,) are connected to the main shaft C, which passes longitudinally through the centre of the vessel—just below its upper deck—by endless ropes *f, f*, as represented in Fig. 2: The said ropes, *f, f*, being wound several times around the main shaft C, then passing outwards over sheaves or rollers attached to the upper deck or guards of the vessel, from which they descend along the inner sides of the vertical shafts or spars D, D, to sheaves or rollers connected to the boxes B, B, and thence rise to the main shaft (C,) again.

The ropes *f, f*, are connected to the vertical shafts at *i, i*, as shown in Figs. 1 and 2. It will therefore be perceived, that by turning the main shaft C, in one direction, the buoyant chambers will be expanded into the position shown in Fig. 1; and by turning the shaft in an opposite direction, the chambers will be contracted into the position shown in Fig. 2.

In Fig. 3, *e, e*, are check ropes, made fast to the tops of the boxes B, B, and to the upper sides of the buoyant chambers; which ropes catch and retain the upper sides of the chambers when their lower sides are forced down, and cause the chambers to be expanded to their full capacity. By varying the length of the check ropes, the depth of immersion of the buoyant chambers can be governed. A suitable number of openings *m, m*, are formed in the upper sides of the buoyant chambers, for the admission and emission of air when the chambers are expanded and contracted.

The ropes *f, f*, that connect the main shaft C, with the shafts or spars D, D, (rising from

the buoyant chambers,) may be passed from one to the other in any direction that may be deemed best, and that will least incommode the deck of the vessel; or other mechanical means may be employed as the medium of communication between the main shaft and the buoyant chambers, if it should be found expedient.

I shall generally make the main shaft C, in as many parts as there are corresponding pairs of buoyant chambers, so that by coupling the sections of the shaft together, the whole of the chambers can be expanded at the same time, and by disconnecting them, either pair of chambers can be expanded, separately from the others as circumstances may require.

The buoyant chambers may be operated by the power of the steam engine applied to the main shaft C, in any convenient manner, or by man power.

Where the guards of a vessel are very high above the water, the boxes B, B, for the reception of the buoyant chambers when contracted, may be dispensed with, and the chambers be contracted by drawing them against the under side of the guards. Or, protecting cases may be secured to the under sides of the guards for the reception of the buoyant chambers when contracted.

When it is desired to combine my expandible buoyant chambers with vessels which

have no projecting guards; shelves or cases must be strongly secured to their sides for the reception of the buoyant chambers.

I wish it to be distinctly understood, that I do not intend to limit myself to any particular mechanical arrangement, in combining expandible buoyant chambers with a vessel, but shall vary the same as I may deem expedient, whilst I attain the same end by substantially the same means.

What I claim as my invention and desire to secure by letters patent, is the combination of expandible buoyant chambers placed at the sides of a vessel, with the main shaft or shafts C, by means of the sliding spars or shafts D, which pass down through the buoyant chambers and are made fast to their bottoms, and the series of ropes and pulleys, or their equivalents, in such a manner that by turning the main shaft or shafts in one direction, the buoyant chambers will be forced downwards into the water and at the same time expanded and filled with air for buoying up the vessel by the displacement of water; and by turning the shaft in an opposite direction, the buoyant chambers will be contracted into a small space and secured against injury.

A. LINCOLN.

Witness:

Z. C. ROBBINS,
H. H. SYLVESTER.

A Presidential Patent

Among the registered patents in the Patent Office at Washington is one for buoying vessels through shallow waters, taken out some years ago by Abraham Lincoln, of Springfield, Illinois.

The method is by the employment of air-chambers constructed on the principle of a bellows, and distended or contracted by ropes, as the depth of water may require. It was by a somewhat similar scheme, on a larger scale, that it was once proposed to bring the Great Eastern through the East River to a dock.

The inventor, Mr. Lincoln, has not had the satisfaction of seeing his patent in use on the Mississippi or its tributaries.

But it has fallen to his lot to be in command of a ship of uncommon burden on a voyage of uncommon danger. It devolves upon him to navigate the ship of state through shallows of unprecedented peril, and over flats of unparalleled extent. The difficulty is how to prevent her grounding and becoming a wreck.

We trust that the President will set the fashion of using his own patent.

We must throw some of his cargo overboard, and buoy up his craft on all sides. He need not change his voyage, or sail for a strange port. But unless he can set his air-chambers at work so as to diminish the draught of his vessel--in a word, unless he can increase her buoyancy, and bring more of her hull into God's daylight, he will run no small risk of losing her altogether.

Feb. 15 Lincoln's Invention. 1929
(From the Hartford Courant.)

Lincoln had to make his university studies in the hard school of practical life; and among the courses that he pursued in this school was a short one in flatboat navigation. His first public speech, by the way, dealt with navigation on the Sangamon river in Illinois. While the family were still living in Indiana he had gone into navigation a bit. He was sixteen years old when he got the job—at \$6 a month—of running a ferry across the Ohio river near the mouth of Anderson's creek. That was in 1825; and later, in 1828, he went to New Orleans as "bow hand" on a flatboat with a cargo of produce.

After the family had moved to Illinois he carried his studies of navigation a step further. In 1831—he was now twenty-two years old—he and his half brother and his brother-in-law built a flatboat and took her to New Orleans with a merchant's cargo. The trip earned fifty cents a day for each of the three, with \$60 to be divided; but there were several incidents, and among them one which is thus described, with its interesting consequence, by Rossiter Johnson in an article printed in 1875:

"Just below New Salem, on the Sangamon, the boat stuck on a dam and was in danger of going to pieces, but was saved by the ingenuity of Lincoln, who invented a novel apparatus for getting it over and saving the cargo. This seems to have turned his mind to the subject of overcoming such difficulties of navigation, and in 1849 he obtained a patent for "an improved method of lifting vessels over shoals." The design is a bellows attached to each side of the hull, below the water line, to be pumped full of

air when it is desired to lift the craft over a shoal. The rude model, apparently made with a pocket knife, and bearing Lincoln's signature, may still be seen in the patent office at Washington."

This was a germ, if not the germ, of the system of compressed air, by means of which the stranded cruiser Yankee was lifted off the Hen and Chickens reef a few weeks ago and by means of which efforts are now being made to raise that vessel just outside New Bedford harbor, where, in consequence of the injury to her hull, she sunk while being towed from the reef. Lincoln had observed that air is lighter than water—for otherwise the air would be below and the water above; and he had mastered his course in navigation so well as to perceive that a boat with a bellows on each side filled with air would float where a boat with no air support would stick fast. This is the whole of the compressed air system of raising ships, except that the air is now pumped into the ship. The air pump,

in some of its various forms, is a very old invention; but it was not in use in the navigation of the Sangamon in 1849, and accordingly Lincoln turned to the bellows as the best means he knew of for lifting flat boats over shallow places. The modern steam air pump is a mere substitution in the case of large and well-built ships with bulkhead compartments.

LINCOLN AS AN INVENTOR

EARLY TURNED HIS ENERGIES TOWARD MECHANICAL PURSUITS.

Macon Man Has Description of Patent Sought by Emancipator on Device to Navigate Boats With Bellows.

Pass. City Star 2-11-23

MACON, Mo., Feb. 10.—That Abraham Lincoln once seriously devoted his attention to mechanical invention, and pursued it so far as to obtain a patent, may be news to some who are unaware of the many activities that engrossed the great President's mind.

In the forties and later the matter of navigation was the big problem in the West. Nearly all the settlements of Illinois and Missouri anywhere near a stream were hopeful that in some way those streams could be made navigable for steamboats, and it seems Lincoln shared this hope regarding the Sangamon River.

The information about Lincoln's patent for the raising of sunken steamboats is from some papers in the possession of Maj. S. G. Brock of this city, formerly chief of the bureau of statistics under President Ben Harrison.

HOW PATENT WAS RECORDED.

The Lincoln patent was recorded:

"Model of sinking and raising boats by bellows below. A. Lincoln, May 30, 1849."

It was stated by some of the old inhabitants of the neighborhood that at one time there was a wrecked boat in the Sangamon River, about four miles from Springfield, Ill., as the result of an attempt of Lincoln's to show that the little river was navigable. It was the dream of the pioneer planters that if boats could voyage up the little streams near their holdings they would become wealthy from the proceeds of their crops. They then could get them to the big markets, where big prices were paid, and throughout the states of the Mississippi valley craft of various kinds made many experiments at upstate navigation on small streams.

MANY SHALLOWS IN RIVER.

When he lived in old Salem it is said Lincoln had great faith in the future of the Sangamon River as a material arm of western industry. The big problem as he and others saw it was in getting the boats over the shallow places. The time was far in advance of appropriations for river improvement, and some other means had to be devised for overcoming obstacles to navigation. In the Sangamon River were numerous stretches of comparatively "easy water," for boats, and then would come a lot of sandbars or shallow places.

It was this problem on which Lincoln worked. The model he made may still be in the patent office, or on exhibition somewhere. It would be almost priceless now. It never was demonstrated in actual work, however.

HOW IT "WORKED."

Under the guards of the boat was a "battery" of blacksmith bellows. When the boat reached a place where the bottom would strike the river bed the bellows were supposed to act as "lifters" for the boat, like an air-inflated bladder. It was figured the bellows would raise the boat so its draught would be considerably reduced, and it would slide over the bars like a raft. Once over the shallows the air would be released from the bellows and the boat would proceed until it came to the next bad place.

It's a pity no record was ever made of Mark Twain's view of the invention.

But soon after Lincoln obtained his patent his mind was diverted to weightier matters, though he never forgot his "safety first" invention for boats. It is said that soon after his inauguration as President he got one of the patent office officials to look up the model for him.

OTHER CURIOUS INVENTIONS.

Lincoln's invention was no more curious than others patented in the early part of the last century, which showed what was then conceived to be the needs of the people. One man invented an alarm clock which, when it went off, would drop the bed and the sleeper would hit the floor with a bump. The inventor thought there were men who would pay money for a mechanical apparatus that would haul them out of bed.

Another recorded invention was a combination plow and cannon, so if the farmer were attacked by Indians while at work in his field he would be prepared with one load, at least.

"Abe" Lincoln

as an
Inventor

1924

THAT Abraham Lincoln once seriously devoted his attention to mechanical invention, and pursued it so far as to obtain a patent, may be news to some who are unaware of the many activities that engrossed the great president's mind.

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Great Presidents Of United States Able Inventors

12-18-28

Two presidents of the United States, both of whose birthdays are celebrated in February, were, in their own right, inventors. They are George Washington and Abraham Lincoln.

Washington invented a plow. He had seen one which had been brought over from England and immediately his practical mind worked out an improvement. Then he called Peter, his smith, and set to work constructing it. When finished it developed the curious eccentricity of not wanting to stay on the ground. Washington designed it all over again and the plow was a success.

Twenty-eight years later, Washington, returning to the idea, designed a plow that would do two things at the same time—sow grain and plant it. It was a brand new idea in agricultural machinery. Part of the device was in the shape of a barrel which discharged the grain, explains Homer Croy in the February Popular Science Monthly, while behind was a roller which broke up the clods and kicked the earth over the seed.

Lincoln, when a member of Congress, once returned home from Washington by way of Niagara Falls. While proceeding by boat through Lake Erie, the very thing occurred which had happened when he was a boatman taking a flatboat to New Orleans. The boat stuck. The captain of the vessel had all hands force barrels under the side of the ship below the water line. Slowly, but surely, the boat began to rise. Lincoln stood at the rail watching intently. Taking a piece of paper from his pocket, he sat down, placed it on top of his high hat, and began to make some sketches.

When he returned to Springfield he spent odd moments whittling out a model of his invention. The idea was that, by means of bellows, air could be forced under the ship to lift it free from its difficulty. When the model was finished it was about 20 inches in length. He gave it a rather long and impressive name—"An Improved Method of Lifting Vessels Over Shoals."

He sent it to Washington and applied for a patent. It was granted by the issuance of Number 6469, and the model Lincoln built can be seen today in the Patent Office in Washington.

LINCOLN'S INVENTION IS FOUND IN CAPITAL

One of the most interesting things in the nation's capital for motor tourists is a homely, useless little model of a patent issued to Abraham Lincoln, says the American Automobile association.

The A. A. A. points out that the model of this unusual device, which was designed as "an improved method for lifting vessels over shoals," has been recently moved from the patent office and is now amid the carefully guarded treasures in the Smithsonian institution.

WASH. POST, FEB. 12, 1929

Washington and Lincoln Both Were Inventors

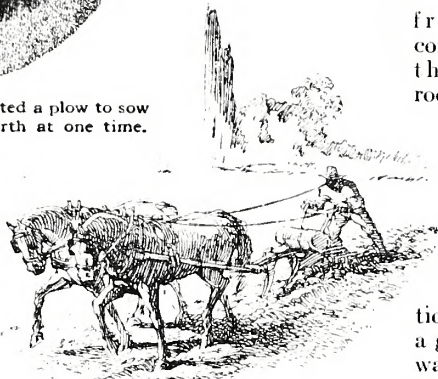
New Light on the Great Presidents Whose Birthdays We Are Celebrating This Month



George Washington invented a plow to sow grain and cover it with earth at one time.

By

HOMER CROY



FEBRUARY brings to mind that two Presidents, both born in the same month, were, in their own right, inventors. They are George Washington and Abraham Lincoln.

And in their inventions they showed their different natures.

We'll take Washington first because he came first. Washington was the richest man in America; a country gentleman. He had an unswerving passion for practical things. Figures and exact quantities especially appealed to him. Once he set two workmen on his estate to counting how many seeds were in a bushel of clover. It took days, and when it was finished he carefully made a note of it.

Washington, on account of his social position, entertained a great deal. At his dinners he always served wines. One day as the bottles were going around he noticed that there was some confusion as to which bottle was which and what was what. His practical mind immediately fastened on it; here was something that needed remedying. He invented a device holding four bottles and which could be passed around so that all the bottles came to a guest at the same time. From these he could make his choice. In his own words Washington said of the contrivance:

"It will be more convenient for passing the bottles from one to another than handling each bottle separately, by which it often happens that one bottle moves, another stops, and all are in confusion."

The idea was similar to a caster, or a cruet for condiments for the table, except that it was more elaborate. It consisted of a little platform mounted on wheels so that the device with its

to such an extent that no formal dinner was considered correct unless it had a Washington wine coaster plying up and down the festal board to serve diners with the wine of their choice.

A wine serving device! Can you imagine Abraham Lincoln—that simple, homely son of the soil—inventing such a thing?

What next did the industrious, practical, Washington make? This time it had to do with his estate. It was a plow. He had seen a plow which had been brought over from England, and immediately his practical mind worked out an improvement. Then he called Peter, his smith, and set to work constructing it.

The plow, when finished, developed the curious eccentricity of not wanting to stay in the ground. Washington designed it



freight of wines could be rolled along the great dining room tables used in those days. It was given the name of "coaster," as it could coast around the table.

The invention was pronounced a great success, and was taken up by the gentry of Virginia

all over again. At last the idea was whipped into shape, and then Washington proudly brought out two of his handsomest carriage horses and attached them to the plow. It nearly ruined the horses, for the ground was rocky and the plow began to jump, and the horses started to run away. Later, work horses were substituted and the plow was a success.

Twenty-eight years later Washington, returning to the idea, designed a plow which would do two things at the same time—sow the grain and plant it. It was a brand-new idea in agricultural machinery. Part of the device was in the shape of a barrel which discharged the grain, while behind was a roller which broke up the clods and kicked earth over the seed.

WASHINGTON never tried to make money from his inventions and they were never put on the market. But as President he encouraged inventions; he signed the first patent law passed by Congress and attached his name to the first letters patent issued by the United States.

Lincoln had no interest in stately dinners where a wine coaster would be a useful and pleasing device, or in farming. He was born on a farm and got off it just as quickly as he could.

Lincoln turned to something he knew about. River boating. When Lincoln was twenty-one years old he went on a trip down the Mississippi River to New Orleans on a flat-boat and for the work he did he received the salary of twelve dollars a month.

He got as far as New Salem, Illinois, the bottom of the boat grated on a mill-dam, and stuck. Nothing under high heaven could budge it. The front part

(Continued on page 137)



During spare hours in his law office, Abraham Lincoln whittled out a model for his device to lift vessels over the shoals.

Washington and Lincoln Both Were Inventors

(Continued from page 23)

of the boat was over the dam and was so pointed down that the water got in and sank the craft lower and lower. Things looked bad. A load of pork barrels began to slip toward the sinking end.

People from the town came out to enjoy the excitement. But to Lincoln it was no holiday. All day he worked there, trying to scheme out a method to save the boat. At last he hired another boat, brought it up as close as he could, and unloaded the pork barrels into it. Then, getting an auger, he bored a hole in the bottom of his own boat, and invited the people to come on and help weight down the other end. The water began to drain out, and the boat was saved.

"That young feller, he's got ideas," the crowd said.

Safely over the dam, Lincoln plugged up the hole and got the boat to New Orleans. But the experience made a deep impression.

TIME passed, and the former river boatman went into politics and was elected to Congress. Once, returning home from Washington by way of Niagara Falls, he was proceeding on by boat through Lake Erie. And what should happen but the very thing which had happened when he was a boatman on the way to New Orleans. The boat stuck.

The captain had faced that problem before. He piped all hands out and ordered them to take all the barrels which could be found aboard and to force them under the side of the ship below the water line. Imagine the shouting and hullabaloo that went on as this was done by the rough deck hands of the day! And then, slowly but surely, the boat began to rise. And as it rose Lincoln stood at the rail watching intently. This was his own language, something he knew about. Seventeen years ago he had wrestled with the same difficulty.

Taking a piece of paper from his pocket, Lincoln sat down, placed it on top of his high hat, and began to make some sketches.

"I think maybe I've got an idea," he said.

When he returned to Springfield he went to see a mechanic who had a shop near Lincoln's law office. The man loaned Lincoln his tools and Lincoln began to work out his invention in the man's shop. The idea of it was that, by means of a bellows, air could be forced under the ship to lift it free from its difficulty.

HE USED the tools, but much of the device he whittled out by himself. Contrast the different methods employed by Washington and Lincoln. When Washington had an idea for an invention he could have his own smith do the work for him. Lincoln had to do his own.

Lincoln began to whittle at the model, but also he had to keep his law office going, and so he took it to his office and sometimes would do some of the whittling between clients. At last, the model was finished. It was about twenty inches long. He gave it a rather long and impressive name—"An Improved Method for Lifting Vessels Over Shoals." He sent it to Washington and applied for a patent. It was granted by the issuance of Number 6,469, and Lincoln was really and actually an inventor. The model he built can be seen today in the Patent Office in Washington.

But Washington was a more practical man in this respect than Lincoln was, for Washington's inventions were used, while Lincoln's wasn't.

Like Washington, Lincoln had an interest in mechanics, but his interest was that of a lawyer. Once he delivered a lecture which he called the "Age of Different Inventions." He liked to talk and philosophize about inventions, while Washington was interested in getting out and making an invention work.

The Portal, February 9, 1929.

Lincoln an Inventor

INVENTION has been the hobby of many famous men, and our own Abraham Lincoln used his leisure time to invent a device for buoying vessels over shoals. But evidently Lincoln was a better statesman than an inventor, for there is no record that anybody ever tried his invention. When a young man he had taken a trip by flatboat down the Ohio and Mississippi Rivers to New Orleans, and had noted the troubles of the navigators on the shoals. After steamboats began to replace the flatboats, he conceived the idea of attaching buoyant chambers much like huge bellows to the sides of the boats, to be inflated or otherwise forced open by the engine when the steamboat went on a shoal. The model of the device is still preserved by the Patent Office at Washington.

IN ONE of the treasure rooms in the Smithsonian Institution, Washington, is a homely, useless little model of a patent which was never a success and which was never used. The principle which it covers will never be used and altogether it is worthless. And yet in the course of a year more people come to gaze at it than any other model in all this great storehouse of history. Strange, isn't it?

But the people aren't fools, for it is a very unusual device. It is the model for a patent issued to Abraham Lincoln, the greatest man that America has ever produced. And he made it himself, mostly whittled it out with his knife, and there it stands in Washington as a mute emblem of the great interest Abraham Lincoln had in mechanics and inventions.

There is a story behind it:

When Lincoln was twenty-two years old he went upon a great adventure—that is, for him, a country boy raised miles from a railroad and whose father could not read or write. He was engaged by a millionaire (or so it seemed) to make a trip down the Mississippi River at the fabulous salary of twelve dollars a month. Why! it wasn't money—it was wealth. Twelve dollars a month and all he had to do was to work fourteen hours a day. He had merely to go into the timber, cut the logs, build the gunwales, carpenter the flatboat into shape and then launch it. The rest of the time was his to idle away as he pleased. And here we see young Abraham Lincoln, tall, homely, ungainly, chaperoning a terrible old flatboat down the Mississippi.

Evenings they would tie up at a bank and the people would come down and look things over. One night a sleight-of-hand man came on board and started to do his tricks. In the course of them he stepped over to Lincoln and asked to borrow Lincoln's hat, explaining that he was going to take eggs out of it. Lincoln fished around and found his hat

A. LINCOLN INVENTOR

Amusement By HOMER CROY*

Drawing by Iris Beatty Johnson

The news got out that a boat was sinking and people from the town made a holiday of it. Nice bit of excitement—to them. But to Lincoln it was a serious affair. If he let the boat sink, things would be in a bad way for him. All day he worked there, trying to scheme out a method to save the boat



and gave it to the sleight-of-hand man in a hesitating way.

"What's the matter, don't you want me to take eggs out of your hat?" the man asked.

"No high-class, self-respecting eggs would get in my hat," answered Lincoln.

In spite of the humor of it, Lincoln was serious, for his hat was a tattered and sadly dilapidated affair.

And so now we see Lincoln, tall, gangling, in blue homespun pants and home-made coat, a vest and rawhide boots, with his trousers stuffed in the tops of his boots.

One day as they were rounding the bend at New Salem something happened. The water was low, the bottom of the

boat grated on the milldam and there it stuck and nothing under high heaven would budge it. A part of the boat was over the dam and was so pointed down that the water got into the boat and pulled it lower and lower. Things were bad, the boat and

cargo were about to be lost. There was a load of pork barrels in the boat and now they began to slip toward the sinking end of the craft.

The news got out that a boat was sinking and people from the town made a holiday of it. Nice bit of excitement—to them. But to Lincoln it was a serious affair. If he let the boat sink, things would be in a bad way for him. All day he worked there, trying to scheme out a method to save the boat, but things didn't look any too bright.

Lincoln engaged another boat, brought it up as close as he could and unloaded the pork barrels into this, and then getting an augur bored a hole in the bottom of his own boat and then invited the people to come on and help weight down the other end. The water began to drain out, and the boat was saved.

"That young feller, he's got ideas," the crowd said.

Safely over the dam, Lincoln plugged up the hole and got the boat to New Orleans. But the trouble that the boat had got into made a deep impression on him. He knew what it meant for a boat to get caught on the shoals.

Here a peculiar trait of his mind began to manifest itself—his ability to look through a thing and to resolve it to its simplest elements.

"I always like to cut out the underbrush first," he used to say.

Anything in the way of a mechanical contrivance interested him. Other people might give it a casual glance, but he liked mentally to take it to pieces and to see what made it tick. Often when some new invention was brought to his notice he would stand before it, lost in thought, almost as if he wasn't seeing it at all, and then he would ask a question and the question would show that he had worked the whole thing out in his mind.

(Continued on page 37)

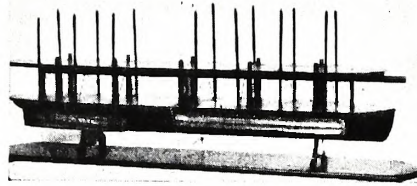
*Author of the novels, "West of the Water Tower," "They Had to See Paris" and six other outbursts.

the happy couple gazed upon Niagara Falls.

This particular year—seventeen years after the flatboat had got stuck on the milldam—Lincoln left Washington and started back to Illinois by way of Niagara Falls, as all good people did.

After leaving Niagara Falls, Lincoln continued on home by boat through Lake Erie. As the boat proceeded there was a dull grating and the same thing which had happened at New Salem had happened again on Lake Erie. The boat had stuck.

The captain ordered all hands to fall to, to collect all the boxes and barrels on the boat, and to take them over the side and to force them under the ship. There was a great shouting as the men scurried away to their tasks; the boxes and barrels were tossed about, and then inch by inch the boat began to rise. At last, it was clear of the sandbar and was able to steam away.



In the Smithsonian Institution in Washington is a homely, useless little model of a patent issued to Abraham Lincoln. He made it himself, mostly whittled it out with his knife

Here again was something that Lincoln knew about—the same old trouble of a boat getting stuck. He had watched the operations with intense interest and now a thought began to form in his mind. Navigation in America was in a very rudimentary state; boats were constantly getting into difficulties, and his practical, analytical mind set to work on the problem.

"I think I've got a way to work this out," he said when he returned to Springfield.

Near his office was a mechanic who had a small shop and whom Lincoln knew. The man lent Lincoln his tools and Lincoln started in to work out an invention through which, by means of a bellows, air could be forced under a ship and lift it free from obstructing shoals.

Lincoln set about it with the intensity and absorption he had for anything which interested him. Most of the device he whittled out by himself, and some of it was from cigar boxes. He didn't fancy it up any; he was principally interested in making the model tell the story. He brought the model, which was about twenty inches long, to his office and between clients he would get out his knife and work on the invention.

The idea back of it all was a method to help along navigation. "An Improved Method for Lifting Vessels Over Shoals" he called it. In his application he used some rather fancy words which made it sound more complicated than it was—"expansible buoyant chambers" was one of them.

At last, the model was done, and he sent it to Washington; it was considered, and eighty years ago in May of this year he was granted letters patent, and by the issuing of Number 6469 Abraham Lincoln became an inventor in his own name.

This interest of Lincoln's in mechanics walked with him throughout life. Once, in his capacity as attorney, he was called to Chicago to act as counsel in a case. While there he went to visit an old friend of his who lived on the shore of Lake Michigan. That evening after supper they sat in the "parlor," as it was called in those days, talking, and the conversation swung around to inventions. Lincoln began to talk about the inventions in the Bible and to the astonishment of the other guests gave a most interesting talk on the subject.

Some one asked, "Mr. Lincoln, how did you ever get interested in inventions as they are mentioned in the Bible?"

"Well," he said thoughtfully, "I've always been interested in inventions," and then went on to tell that he had once got into a discussion with some friends back in Springfield as to the precious metals mentioned in the Bible. He had begun to read the Old Testament on the subject, and as he read his interest widened. From precious metals he went to discoveries and inventions and learned so much about them that he became something of a local authority on the subject.

Again he had found a subject that interested him and he threw himself into it with characteristic energy. He talked inventions and mechanics to all his friends; he emphasized the part they had played in the progress of the world, and how they would change the world in the years to come. This especially was a conversational hobby with him, and as he talked about it his mind would run ahead of him as he would try to vision what the world would be like with the increase of inventions.

Now thoroughly absorbed in inventions and their possibilities, he got up a lecture on the subject which he called "The Age of Different Inventions" and delivered it.

Although Lincoln thought much on the subject of mechanics and inventions, and although he talked much about it, speculated and lectured on it, the little hand-made, whittled model in Washington is for the only patent that was actually granted to him.

He saw a great need for an invention to assist navigation and he did the best he could to work out a helpful device. Could any one do more?

LINCOLN INVENTION FOR SHIP REVEALED

Future Emancipator's Device
to Make Vessel 'Walk' Over
Shoal Didn't Work, However.

ON VIEW AT HOBBY SHOW

Letter He Wrote to Editor Vies
With Old Dime Novels and
Jackson's Farewell Speech.

New York Times
9-11-35

Almost a half acre of things collectible was unveiled yesterday morning at the opening of the second annual Hobby Collectors Show in the Hotel Pennsylvania. The arrangements of the closely packed booths in such that precious historical documents are only a few steps from ant colonies under glass, at \$2 or \$3 a colony.

Hundreds of persons circulated among the exhibits yesterday, stooping to examine old prints and manuscripts and smooting the desiccated fly-leaves of ancient books.

With the reverence of a jeweler exposing his rarest stones, Forest H. Sweet of Battle Creek, Mich., brought out his choicest specimens of Lincoln relics from the collections of the late Henry M. Leland.

One of them is a record of a patent issued to "Abraham Lincoln, of Springfield, Ill.," in 1849, for "An Improvement in the Method of Luffing Vessels Over Shoals." The "improvement," according to Mr. Sweet, was a complicated, centipede-arrangement of "legs" along the sides of the vessel. This on being let down, was to permit the vessel to be "walked" over the shoals. It could never be made to work, though, Mr. Sweet said.

Another, more typical relic, is a letter sent by him to Henry J. Raymond, founder and first editor of THE NEW YORK TIMES. On March 6, 1862, President Lincoln sent a special message to both houses of Congress, recommending the emancipation of slaves by purchase. Mr. Raymond and other New York editors wrote editorials opposing this. In his letter to Mr. Raymond the President said:

"Your paper, however, intimates that the proposition, though well-intentioned, might fail on the score of expense. I do hope you will reconsider this. Have you noticed the facts, that less than one-half day's cost of this war would pay for all the slaves in Delaware at \$400 per head?—that eighty-seven day's cost of this war would pay for all the slaves in Delaware, Maryland, the District of Columbia, Kentucky and Missouri, at the same price?

"Were those States to take the step, do you doubt that it would shorten the war more than eighty-seven days and thus be an actual saving of expense? Please look at these things and consider whether there should not be another article in THE TIMES."

The plan, however, came to nothing. Mr. Sweet considers it typical of the subtle irony of Lincoln that nothing was said in this letter of the bloodshed of war and that the argument was kept down to the plane on which it was initiated by the editors—that of dollars and cents.

Has Jackson's Farewell Address.

Mr. Sweet also exhibited a copy of Andrew Jackson's Farewell Address, printed on white satin. It was acquired from Andrew Jackson 4th, a great-grandson. Another little-known historical document is a petition of the burgesses of Virginia to King George III in 1772, imploring His Majesty to abolish slave traffic "lest it endanger the very existence of Your Majesty's American dominions."

An exhibit of the Seamen's Church Institute of New York, at 25 South Street, includes a model schooner owned by President Roosevelt, and dioramas, paintings, ship models and women's handbags and belts of plaited rope, all made by unemployed seamen. The dioramas include a perspective of old South Street with the bowsprits of sailing vessels touching the fronts of the buildings.

Collections of old songs, "blood and thunder" fiction (Old Sleuth and Nick Carter), stamps, autographs, minerals, old coins, early American glass and furniture and early maps showing fanciful conceptions of American topography are other features of the show. Charles DeZemler shows the equipment of an itinerant Persian barber who was also a tooth-puller, a chiropodist and a blood-letter.

The show will continue all week.

Patent Centennial Recalls Lincoln Saw Wind Power

BY MALCOLM MCDOWELL.

Abraham Lincoln, in the days before he became president of the United States, envisioned a "wind-power" age. "Of all the forces of nature," he said in the lectures he delivered to lyceums in the middle west during the 1850s. "I should think the wind contains the largest amount of motive power—that is, power to move things. Take any given space of the earth's surface, for instance, Illinois; and all the power exerted by all the men, beasts, running water and steam

power over and upon it shall not equal the one-hundredth part of what is exerted by the blowing of the wind over and upon the same place."

Preparations for the celebration next Monday in Washington of the 100th anniversary of the founding of the American patent system discloses a copy of a lecture on discoveries and inventions which Lincoln delivered in his prepresidential days. It will be exhibited among the memorabilia which will form an important section of the general

exhibit of "first" inventions which the national centennial committee, of which Dr. Charles F. Kettering, president of General Motors Research Corporation, is chairman, is installing.

Lincoln also said of the wind: "And yet it has not, so far in the world's history, become properly valued as a motive power. It is applied extensively and advantageously to sail vessels in navigation. Add to this a few windmills and pumps and you have about all. As yet the wind is an untamed, unharnessed force, and quite possibly one of the greatest discoveries hereafter to be made will be the taming and harnessing of it."

One thousand leaders of science,

engineering and industry will meet in the capital for the centennial, the committee announces. All of the major national scientific and engineering societies, colleges and universities, government bureaus, trade organizations and the great industries are co-operating in arrangements for the event.

Six noted inventors are among the many who will take part in the centennial. They are Dr. Orville Wright of Dayton, O., co-inventor with his brother Wilbur of the first successful heavier-than-air flying machine; Simon Lake of Milford, Conn., inventor of the submarine; Dr. Vladimir K. Zworykin of the Radio Corporation of America, New

York, inventor of the iconoscope, which is the heart of television; Dr. William D. Coolidge of the General

Electric Company, Schenectady, N. Y., who developed the improved types of X-ray tubes now in use;

Dr. Lee De Forest of Los Angeles, who made radio practical, and Dr. Leo H. Baekeland, Yonkers, N. Y.,

whose "Bakelite" was the forerunner of the host of modern plastics.

Lincoln the Inventor

All America pays homage to Abraham Lincoln as the Great Emancipator, a man who was wise in the law, steadfast in what he considered to be the right and honest as the day. But very few people know Lincoln the inventor.

Lincoln liked to "tinker" with things and there is proof that at least once he applied himself to creating a device for solving a difficult physical situation in an original and practical manner.

Pontoons Like Bellows

As a young man, Lincoln traveled considerably on the Ohio and Mississippi Rivers, which bore the burden of transportation in the days before railroads rose to prominence. Not infrequently, the river boats would run aground on mud or sand bars, necessitating much labor and delay before they were free again. Lincoln had often watched them being pulled from the clutches of the river's bed, and it set him to thinking. He was handy with tools and thoroughly practical in solving difficult physical problems. His thought on this matter resulted in a device which he patented in the early days of the United States

Patent Office. The original model which he made, after gathering dust in the Patent Office for nearly a century, was finally turned over to the Smithsonian Institution.

There Lincoln's model may be seen today, with two pontoons on each side of a river boat in miniature, the whole arrangement featuring 14 great poles piercing an upper deck as well as the lower deck and connecting with pontoons. The idea was, that should the boat become stuck on a bar, the crew would man ropes connected with pulleys to the long poles. The poles would then push down on the pontoons which would act like bellows filling with air and thus floating the boat.

There is no record that the invention was ever tested much less put into practice. Soon the attention of passengers and commerce was drawn away from the rivers to railroad lines, and the need of such a device as Lincoln had made, dwindled.

However, if anyone still thinks it a good idea, every last detail can be seen in the Smithsonian model. As the patent rights have long expired, there is nothing to prevent any riverman from putting it into

use. A few experts who have viewed the contraption consider it highly impractical.

But while Lincoln's own invention may never have been put to use, he did have a marked respect for natural science and invention. It was during his administration as President that the National Academy of Sciences was given its charter by Congress. This body was formed in order that the nation as a whole might benefit from the knowledge and experience of the country's leading thinkers in various technical fields. Even today, any agent of the Government who needs it may obtain expert technical advice from the Academy for the asking.

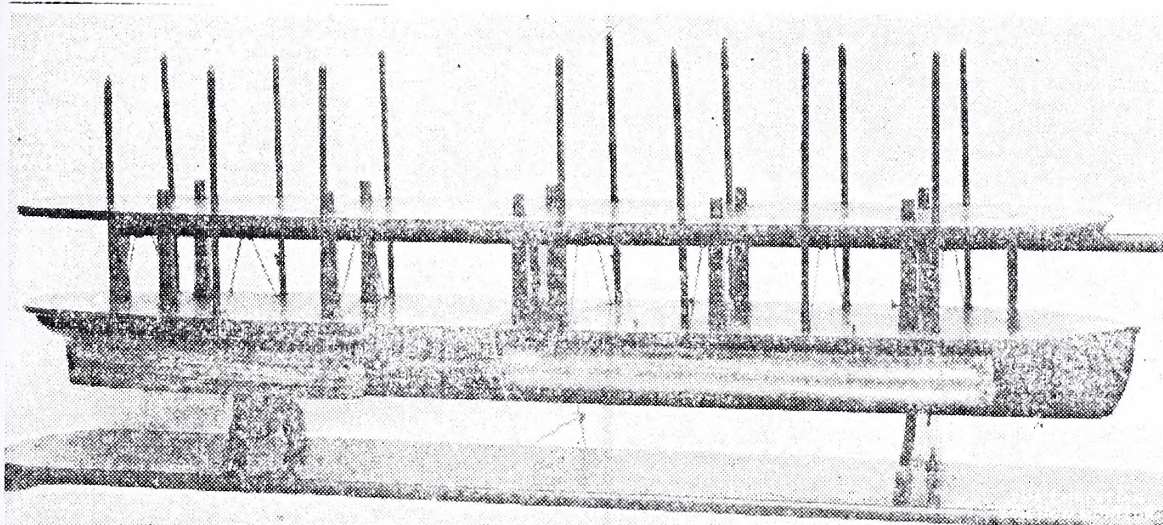
Eager to Learn

Anecdotes about Lincoln are legion, but one in particular shows how he turned to his advantage the few opportunities that came his way for learning. The story is told by Mrs. Asaph Hall whose husband was the Government astronomer at the Naval Observatory.

It seems that Hall had had much experience with royalty and famous persons which caused him to be rather diffident toward them. At the Harvard Observatory where both he and the Prince of Wales were guests at a celebration opening the use of the then "world's largest telescope," he had been made to feel less than nobody in comparison with the honored guests present.

However, there came a time when Hall attended one of Lincoln's receptions shortly after the President himself had signed the astronomer's commission in the United States Navy and he had been assigned to duty at the Naval Observatory.

One night soon afterward, when Hall was alone in the observing tower, he heard a knock at the trapdoor. Leisurely he completed his observation and then went to lift the door. Through it appeared the head of President Lincoln. He had come unattended through the dark streets of Washington to inquire why it was that the moon appeared inverted in the telescope? Surveyor's instruments, with which he was familiar, showed objects in their actual position.



Courtesy of the Smithsonian Institution

Abraham Lincoln Obtained a Patent on This Device for Freeing a Boat That Had Run Aground

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Executive Secretary

June 11, 1946

Miss Helen Nicolay
Kennedy-Warren Apartments
3133 Commonwealth Avenue
Washington, D.C.

Dear Miss Nicolay:

I wish to thank you for your graciousness in receiving me in company with Captain Sheldon on the occasion of my recent visit to Washington. I consider it a rare pleasure that I was able to visit with you, the occasion being doubly interesting because of my deep interest in things relating to Lincoln, on which subject you have had intimate contact through your esteemed father, Mr. John Nicolay.

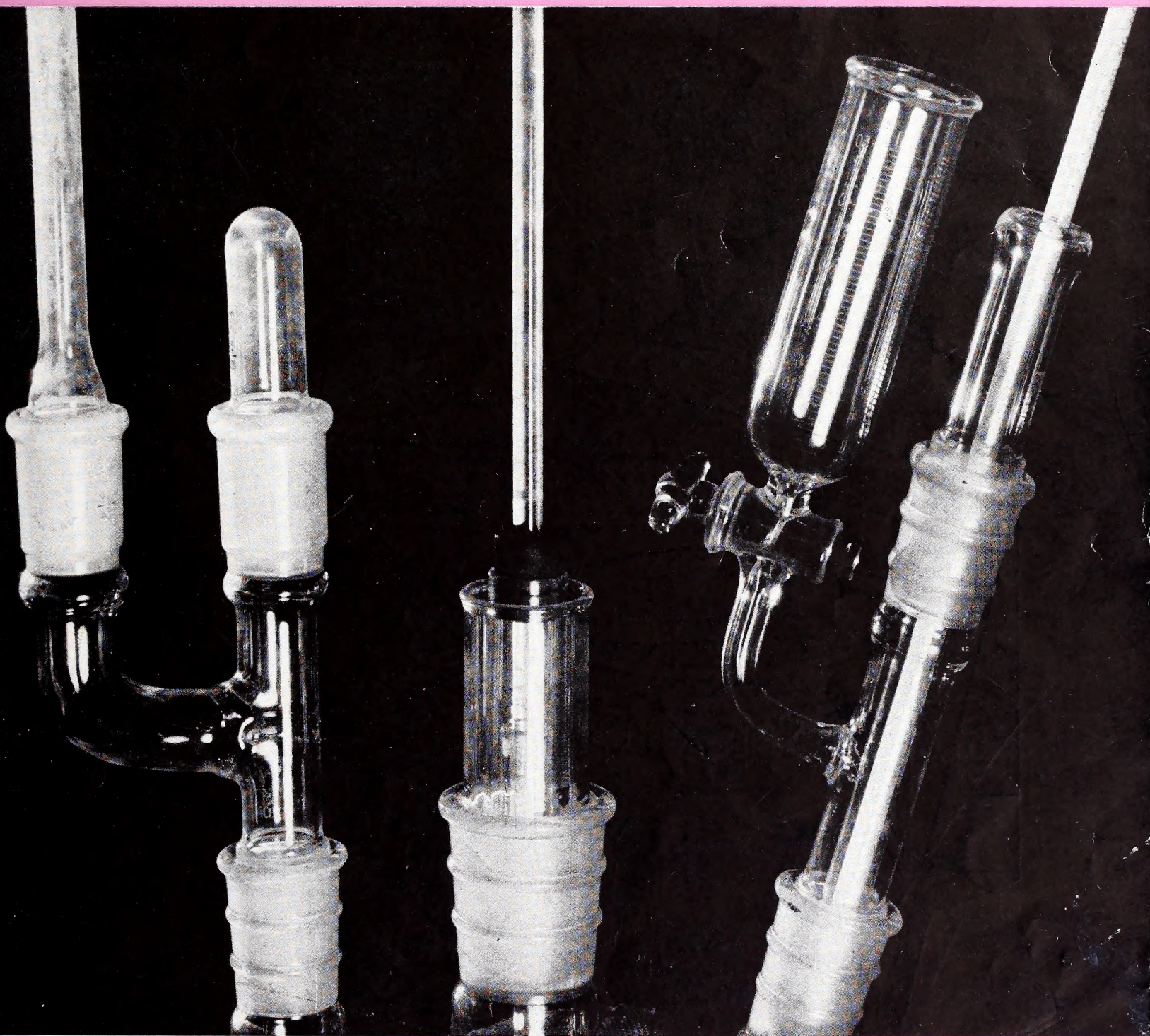
Again thanking you, and looking forward to having the honor of visiting with you at an early date, I remain

Sincerely yours,

Earl C. Kubicek
Executive Secretary

ECK:fs

ILLINOIS TECH ENGINEER



DECEMBER, 1946

THE ENGINEERING MIND

of

ABRAHAM LINCOLN

Scut me

By EARL C. KUBICEK

*after a call upon me accompanied by
Best Sheldon*

William H. Herndon, Lincoln's last law partner, in a lecture entitled, "Analysis of Character of Abraham Lincoln," delivered in Springfield, Illinois, on December 12, 1865, said of Lincoln's mind: "his mind ran back all facts, things and principles to their origin, history and first cause, and further sometimes, namely to that point where forces act at once as effect and cause. He would stop in the street and analyze a machine or other thing, mechanical or other power as exhibited in a wagon, a threshing machine, or a lightning flash . . . Clocks and words, omnibuses and language, paddle wheels and idioms never escaped his observation." He further states, ". . . in time his great logic and power of reason on cause and effect, in creation and relation, in substance and in truth, would form a proposition, an opinion wisely and well, that no human being could well deny, or ever overthrow."

Lincoln, himself, stated his case; "I remember how, when a mere child, I used to get irritated when anybody talked to me in a way I could not understand. I don't think I ever got angry at anything else in my life. But that always disturbed my temper, and has, ever since." It is this characteristic of his mind, his direct simpleness of reasoning, his grasp of the main principles of the problem under consideration, that lead us to refer to him in relation to the engineering field. That Lincoln had enough of the mechanical

genius in him to make him a good mechanic, there is no doubt. He was a builder, first in assisting to construct the log cabins in which he lived, then the flat-boats which he operated. Even after his entry into public and professional life these mechanical dreams never wholly left him. It is this story of the creative impulse in him, his deep-seated interest in things mechanical with which he came in contact throughout a broad law career and later as President of the United States, we can now consider.

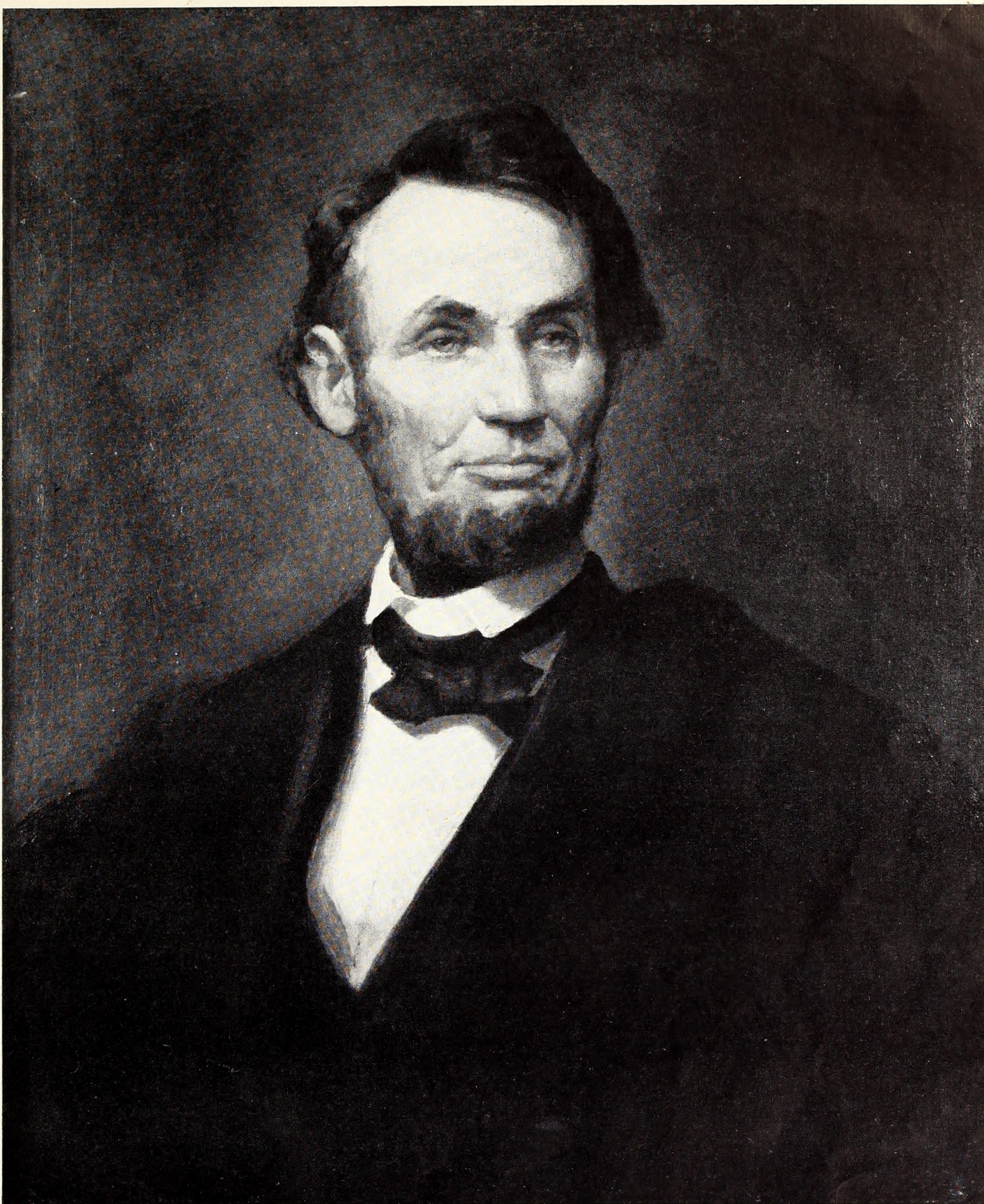
Lincoln sometimes helped his father in the latter's carpentering, though he never professed any great love for the draw-knife and hammer. Lincoln and his father built a wagon for James Gentry, constructing it, "entirely of wood even to the hickory rim on the wheels." Since he had the instruction of his father, an experienced carpenter, we can well accept the statements of early pioneers concerning Lincoln's construction of a scow, which he operated near the mouth of Anderson's Creek, in Indiana, taking passengers from the shore to the steamers passing in the mid-channel of the Ohio. Thus begins the career of Lincoln, as in a rude sense, a navigator, a flatboatman.

The Ohio River, that great artery of traffic, was a passing pageantry of American life of the day. It introduced Lincoln to the life of a riverman and also introduced him to the world be-

yond, impressions of which were readily grasped by his mind and filed for future reference. Through his station passed the lawyers coming from the East to the wilderness, the frontier, and bringing with them the learning of books, the creed of law and order; hunters, the men of the forest, with their tales of days in the not too distant past when wild life roamed the forests in undreamed of numbers; the circuit riders, with stories of the great of their profession, Peter Cartwright and Samuel Scott and others.

These adventurers in understanding undoubtedly whetted the imagination of young Lincoln for more learning. Miss Kate Roby, who knew him in the Indiana days, tells of sitting on the river bank with Lincoln. He surprised her with his knowledge of planetary motion. She says, "He was well acquainted with the general laws of astronomy and the movements of the heavenly bodies, but where he learned so much, or how to put it so plainly, I never could understand."

A clue to Lincoln's learning might lie in his close association with those who had gone further than he in education and in his special ability to assimilate knowledge through such association. The Grigsby family—Aaron Grigsby married Lincoln's sister Sarah—all attended schools outside of the state we are told. Aaron Grigsby studied law, attending school two and



ABRAHAM LINCOLN

Painting by Penrhyn Stanlaws
Courtesy Mission Inn, Riverside, Calif.

one-half years, possibly at Hampden-Sidney, Virginia, as this was the ancestral home of the Grigsbys. Reuben Grigsby studied surveying. It is believed that Lincoln borrowed Reuben's books along with others. James Blair's granddaughter is our authority for stating that Lincoln was coached in the study of surveying by Blair, who had been educated in the East prior to his arrival in Indiana.

Lincoln's skill as a flatboatman was becoming well known and came to the attention of one Denton Offutt, an early promoter of no mean accomplishments in the Colonel Seller's type of salesmanship. He hired Lincoln, John Hanks, and John D. Johnston, Lincoln's step-brother, proposing that they take a flatboat, laden with provisions, from a place of some five hundred persons called Springfield, Illinois, to New Orleans. When his navigators arrived at the place of assembly Offutt did not have the promised boat but offered them extra pay if they would construct a craft for him. This they proceeded to do.

In Lincoln's words, "We found Offutt at Springfield, but learned that he had failed in getting a boat at Beardstown. This led us to hiring ourselves to him for twelve dollars per month each, and getting timber out of the trees and building a boat at Old Sangamon town on the Sangamon River, seven miles northwest of Springfield, which boat we took to New Orleans, substantially upon the old contract."

However an incident took place, one of several, that seemed destined to be a determining factor in shaping the course of Lincoln's life. Uneventful passage was made down the river until the New Salem dam was reached. John Hanks says, "We landed at New Salem mill about April 19th, and got fast on Rutledge's mill dam."

Here the craft seemed destined to end the journey which had begun so favorably. The boat was stuck fast on the mill dam with one end dipping into the water and the other jutting high into the air. Lincoln's inventive genius came to aid. They unloaded some of the provisions and Lincoln went into the village, borrowed an

auger, bored a hole above the outside water-line to allow the water which had been shipped aboard to run out, and the craft was able to pass over the dam. They capped the hole, reloaded their provisions and, to the cheers of the assembled villagers who had gathered to watch operations and remark, "that young feller was a caution to think of such a procedure, continued their journey toward New Orleans.

The impressions of this little hamlet on a hill, gained by Lincoln during this short visit, were evidently very favorable ones for, in the summer of 1831, following his return from the New Orleans expedition, he returned to New Salem to make it his home. His jobs here were many and varied. The faith of Offutt in Lincoln was secure and he remarked to others that he'd soon have a steamboat running up and down the Sangamon and with Lincoln as her captain, "By thunder, she'd have to go." Lincoln found a short term employment with a Dr. Nelson of the village who was removing, with his family and goods, to Texas. Lincoln was hired by Dr. Nelson to pilot a vessel loaded with the household goods through to the Illinois River. Upon the arrival at Beardstown, the pilot was dismissed, after having safely brought the family through this portion of the journey, and returned, by foot, across the sandhills to New Salem.

Politics, as practiced in those days, was both a means of livelihood for those engaged in it and a source of entertainment for an amusement-starved people and Lincoln, who was always easily met and who had worked up a large acquaintanceship in the New Salem vicinity on March 9th, 1832, announced his candidacy for the legislature of the State of Illinois. In view of the deep-seated interest of the community in the navigability of the local rivers and because of his intimate knowledge gained through piloting various craft on these waters, he stated in his opening speech in an appeal to the voters, "From my peculiar circumstances, it is probable that for the last twelve months I have given as particular attention to the stages of the water in this river as any other person in the country. In the month of March, 1831,

in company with others, I conceived the building of a flatboat on the Sangamon, and finished and took her out in the course of the stream. Since that time, I have been concerned in the mill at New Salem. These circumstances are sufficient evidence that I have not been inattentive to the stages of the water."

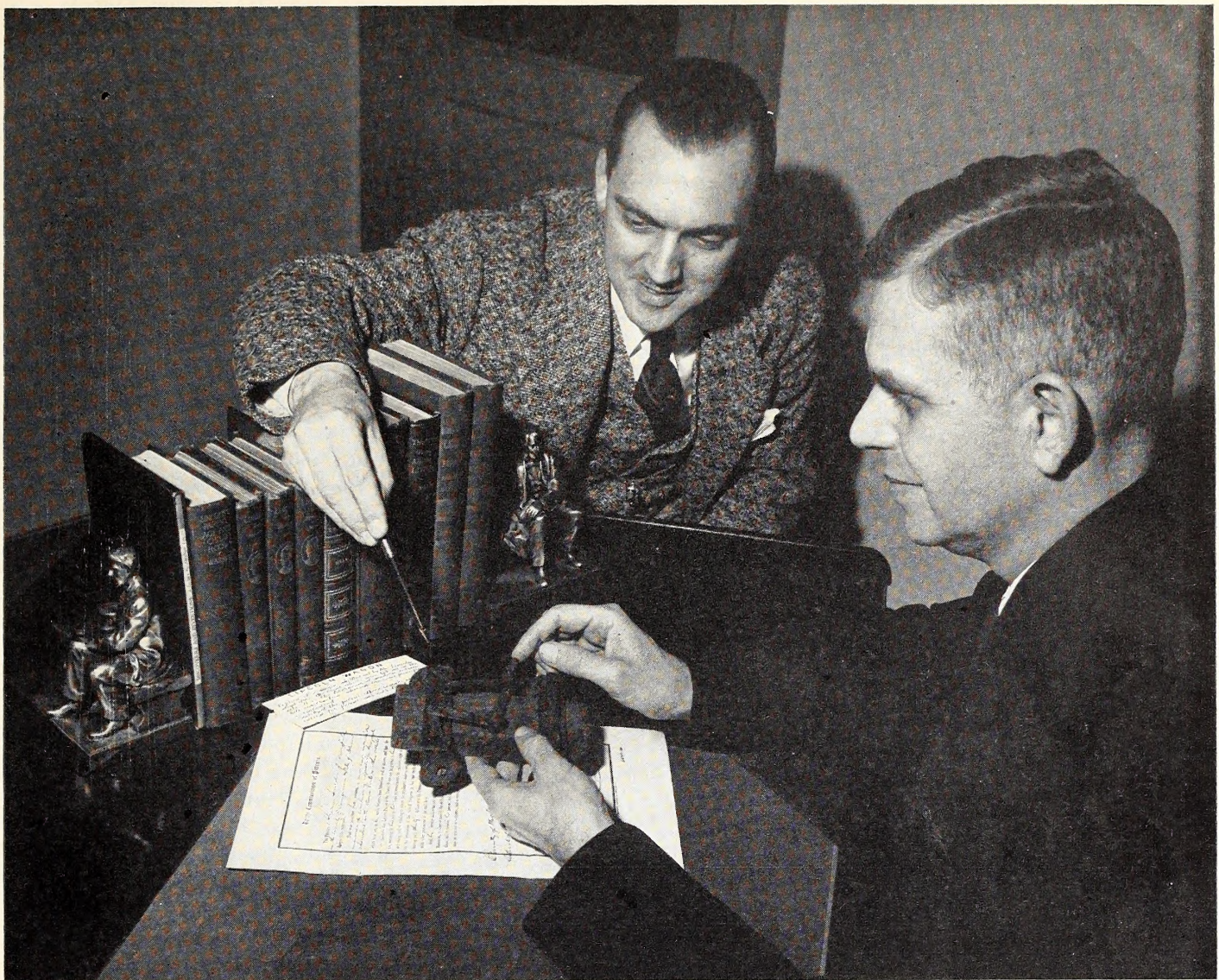
In a nice admixture of political acumen and engineering experience, he expressed the idea that a railroad, connecting Sangamon County with other parts of Illinois was, "... indeed a very desirable object," but the cost ... ? He discussed the geography of the river, and possibilities for improvements in its channel, and pledged himself, if elected, to support all improvements possible in measures brought before the legislature. This initial venture in soliciting public favor was not too successful but he was soon engaged in other ventures that took his mind off defeat. In the winter of 1832, a steamer, *The Talisman*, was advertised to leave Cincinnati and, by sailing the four rivers necessary, eventually reach New Salem bringing to the people of that community "goods directly from the East."

Men of the community, among them Lincoln, met the boat part way and helped to clear brush from along the river banks to allow easy passage. Following an extended stay at Springfield, receding waters in the river warned the officers of the steamer that the return journey should begin soon if it were to be accomplished at all. Lincoln was engaged as pilot for the craft and the return journey was undertaken, but again the New Salem mill dam intervened. A local poet described the happening:

And when we came to Salem dam,
Up against it we went jam;
We tried to cross with all our might,
But found we couldn't, and stayed
all night."

This time Lincoln took no part in the negotiations that followed between the steamer's officers and Rutledge and Cameron, owners of the dam. Eventually part of the dam was taken down, the boat passed through and the incident was forgotten except in the folklore of the community.

John Calhoun, of Springfield, was



WAGON MODEL

Exact replica of the wagon model, made by Abraham Lincoln about 1840, now displayed in the Lincoln Museum, formerly Ford Theatre, Washington, D. C.

This replica is the property of Carl W. Schaefer, of Cleveland, Ohio. Mr. Schaefer, a close personal friend of the late Col. Osborn H. Oldroyd, Lincoln collector and Custodian of the Peterson House, Washington, D. C., found the model, owned by Col. Oldroyd, of such interest that he had this model made from the original.

Of the original model, Mr. Schaefer comments, "On the model made by Abraham Lincoln, which is in the Lincoln Museum in the Ford Theater, Washington, one of the steering arms was broken, and this condition existed as long as I have known of the existence of that model. It was broken at the time that Osborn H. Oldroyd recovered it from the Patent Office. Some years ago, when the Patent Office became too crowded, many thousands of models of different sorts were gotten rid of, but Colonel Oldroyd fortunately obtained the original at that time."

Col. Oldroyd and Mr. Schaefer made a patient search of the patent applications as on file but were unable to find if an application were ever filed by Lincoln, with the Patent Office, for his wagon model. The model is of much interest inasmuch as it is a forerunner of the modern automobile construction embodying a method of turning the front wheels as an independent system.

This particular Lincoln item, along with the many others of the Oldroyd Collection, became the property of the Federal Government through purchase in 1926.

At right, H. T. Heald, President Illinois Institute of Technology; center, the author.

the surveyor of Sangamon County. The constant influx of immigrants into Illinois made Calhoun's office a very busy one and he declared himself in need of another deputy surveyor. A mutual friend of Calhoun and Lincoln brought them together and, while Calhoun was a Democrat and Lincoln was a Whig, and further, Lincoln was not too well versed in surveying, Calhoun appointed him deputy surveyor responsible for all surveys in the immediate vicinity of New Salem provided he apply himself to the study of surveying and prove himself capable.

Lincoln laconically states his version of the story; "The surveyor of Sangamon County offered to depute to Abraham that portion of his work which was within his part of the county. He accepted, procured a compass and a chain, studied Flint and Gibson a little, and went at it."

This "studied Flint and Gibson a little," was no little mean chore for in Gibson's *Surveying* there are chapters on Decimal Fractions, Involution and Evolution, Geometry, Trigonometry, Mensuration of Areas, Levelling, Instruments, and so on, followed by the Tables. Mentor Graham, the village schoolmaster, says in a statement; "Lincoln came to live with me and continued with me for about six months." This was in February, 1833. Mr. Graham claims to have taught Lincoln, among other things, the rules of surveying. Graham's daughter afterward said that her father and Lincoln often sat up in the cabin until midnight, so engrossed in their calculations that they were only aroused when driven forth, by her mother, after fresh firewood to replenish the dying fire that had wholly escaped the attention of the interested scholars.

Considering past contacts with education by Lincoln, though these were of a most informal nature, and the statements of those contemporaries in New Salem, who are our authority for the statement that Lincoln read history, astronomy, philosophy, chemistry and—above all, the newspapers, during the time that they knew him in New Salem, we can well believe that his mind was prepared to assimilate the principles of surveying in an intensive course and to apply them so

well to his work that no survey made by him was ever subject to questioning. When Calhoun's office as surveyor expired in 1835, his successor, Thomas N. Neale, at once reappointed Lincoln as his deputy.

In the *Sangamon Journal* of September 12, 1835, Thomas Neale advises his customers that; "I have appointed John B. Watson, Abraham Lincoln, and John Calhoun, Deputy Surveyors for Sangamon County." He gives an interesting sidelight on the customs of the time in his remarks; "In my absence, persons wishing their land surveyed, will . . . call at the Recorder's Office and enter his or their names in a book left for that purpose." He concluded his advertisement with the assurance, ". . . and their business shall be promptly attended to."

Of record are Lincoln's surveys of the towns of Petersburg, Bath, New Boston, Albany, and Huron. The early surveying records are scattered. However, it is known that three roads, three school sections, and many pieces of farm lands of various sizes are Lincoln's work.

R. B. Rutledge, a New Salem neighbor of Lincoln, gives us a word picture of him at this time and describes his usual attire; "When Lincoln was engaged in surveying he wore jeans, pantaloons, 'foxed' or covered on the forepart and below the knees behind with buckskin. This added to the warmth, protected against the rain and rendered them more durable in performing the labor necessary to his calling."

In November, 1834, it seemed that Lincoln's days as a surveyor were to end suddenly through loss of the tools of his profession. Debts were the only legacy accruing to Lincoln as a result of his days as a storekeeper in New Salem and some claims of those holding the notes of the Lincoln & Berry partnership resulted in a judgment against Lincoln. The sheriff attached his horse, saddle, bridle, and surveying instruments when he was unable to satisfy the judgment. When the articles were sold on execution, "Uncle Jimmy" Short, of Sand Ridge, one of Lincoln's New Salem neighbors and friends, bid in, secured the property, and returned it to Lincoln. A story in friendship is this little picture, for

many years later when Lincoln was President of the United States and "Uncle Jimmy" had removed to California and was destitute, Lincoln heard of his condition and without any solicitation on the part of Short, returned the favor of long ago and appointed Short as an Indian Agent.

A matter of record is Lincoln's statement; "I hereby certify that the town of Petersburg has been surveyed according to law, and that this is a correct plat of the same. (Signed) A. Lincoln." John Bennett, who was the local hotel keeper in Petersburg during later years, recalled that Lincoln spent most of the month of March, 1836, finishing up the survey and the planning of the town that he had commenced the year before.

Lincoln's last recorded survey was of the town of Bath in November, 1836, for John Kerton, the proprietor. Lincoln, in a speech given at Bath on August 16th, 1858, reminded his audience that twenty-two years before he, with his own hands, staked out the town of Bath from a then wooded wilderness.

Lincoln's interest in things mechanical grew steadily, even while he was in Washington, D. C., as Congressman. We find reference, on January 21st, 1848, with the House acting as a Committee as a Whole on the private calendar, that the Congressman from Illinois, Abraham Lincoln, presented the petition of one Uriah Brown, "praying for further testing of his discovery of 'Liquid Fire', to be used in national defenses." The petition was referred to the Committee on Naval Affairs.

The return of the family from Washington was a leisurely one through New England, Canada, Niagara Falls, where Lincoln speculated on the possibilities of commercial use of the power of the Falls, westward through Detroit, and by boat to Chicago. It was on the portion of the homeward passage by boat that an incident occurred that set Lincoln's inventive mind to working on the creation of a device to be used in connection with river passage.

The boat on which the Lincolns were passengers was stranded on a sand bar. The captain, ordering the use of planks, boxes, barrels, etc., forced under the boat, succeeded in freeing the

craft. We are told of Lincoln's deep interest in the proceedings and that he made several suggestions to the officers directing operations which were accepted by them. Mr. Lincoln, immediately upon his return to Springfield from this trip made contact with one Walter Davis, a mechanic whose shop was located nearby, and arranged with him for the use of his tools and shop and assistance in making a model of a vessel incorporating Lincoln's idea conceived as a result of the operations he witnessed earlier.

Lincoln's patent application accompanying his model read, in part, "What I claim as my invention, and desire to secure by letters patent, is a combination of expansible buoyant chambers placed at the sides of a vessel with the main shaft or shafts by means of sliding spars, which pass down through the buoyant chambers and are made fast to their bottoms and the series of ropes and pulleys or their equivalents in such an manner that by turning the main shaft or shafts in one direction the buoyant chambers will be forced downwards into the water, and at the same time expanded and filled with air for buoying up the vessel by the displacement of water, and by turning the shafts in opposite directions the buoyant chambers will be contracted into a small space and secured against injury."

The patent application was made on March 10th, 1849 and Lincoln was granted his patent rights on May 22nd, 1849. Herndon tells of his great interest in what he believed to be the almost unlimited possibilities of his invention and of his working on his idea in their office and explaining to him, Herndon, the principles of the whole idea. Herndon, however, did not take too much stock in his partner's idea and wrote; "This invention was a perfect failure; the apparatus has never been put on any boat so far as known." He hedged on his statements however and qualified his remarks by saying; "Although I regarded the thing as impracticable I said nothing, probably out of respect for Lincoln's well-known reputation as a boatman." The Lincoln model is now on exhibition in the Smithsonian Institution in Washington, D. C.

Patent cases, with their nice prob-



MEMORIAL MARKER

Photo by Author

lems in mechanics and engineering, had a peculiar fascination for Lincoln. His reasoning, his power of analysis and a comprehensive grasp of the subject as a whole made him a force to be reckoned with in court.

A case in point is that of the suit, *Parker v. Hoyt*, an action for the infringement of a patent water wheel, which came to trial in Chicago during June, 1848. Lincoln was one of the counsel for the defendant. The defendant placed his reliance on an older patent to establish the want of novelty in the invention of the plaintiff. Lincoln took a deep personal interest in

the case, using his earlier experiences in tending a saw-mill to present an argument to the jury explaining the action of water on the wheel in so clear and intelligible a fashion that the jury was able to comprehend all the points and line of defense of his side of the case. The court, in its charge to the jury, had told them in effect that the prior patent, on which the defendant was placing his reliance, was, in effect, no defense at all, but in spite of this the jury returned with a verdict for Lincoln's client. According to those who

See *LINCOLN* on Page 38

LINCOLN

(Continued from page 17)

were closely associated with him, Lincoln always regarded this case as one of the most gratifying triumphs of his career.

This power of Lincoln's to clearly demonstrate his ideas was no mere happenstance. In order to understand fully just what the phrase, "demonstrate" meant, Lincoln, though past forty years of age, began the study of the six books of Euclid. He carried the books with him on the circuit and applied himself with vigor to their mastery. Swett, who traveled the circuit with him says, "I have seen him myself, upon the circuit, with a 'geometry' or an 'astronomy' . . . working out problems and propositions in moments of leisure." Herndon says that Lincoln, after his return from Congress, was a "hard student", especially in mathematics. The maturing of his mind was brought about by his ambition to state a conclusion so logically that the proposition would be proved with mathematical certainty—that it be so well established as to exclude the possibility of doubt or denial.

At the December, 1851, term of the United States Circuit Court, Lincoln had a case of extraordinary interest, one which provided him with a background that he was able to put to good use in later years in the famous "Effie Afton Case." This case was that of the Columbia Insurance Company v. Curtenius et. al. The plaintiff, represented by Lincoln and others, were suing the stockholders of the Peoria Bridge Company for damages suffered by them as insurers of a canal boat and cargo sunk in collision with the pier of the bridge in the channel of the Illinois River. The defendants pleaded that an act of the Illinois legislature authorized them to construct the bridge. Lincoln demurred on the ground that the legislature had no right to authorize the obstruction of a navigable stream. The case turned on the point of the state having the power of obstructing a navigable stream running within its territorial limits. How well this problem of navigation must have brought to the mind of Lincoln his former days as a riverman. The

court later decided that the legislature did not have the right to authorize the obstruction of the river and settlement was reached by compromise.

Lincoln's last case of term of the Illinois Supreme Court, February 3rd, 1855, was representing the defendants in error in the case, Edmonds v. Meyers, et. al. This was popularly known as the "Horological Cradle Case." Patent rights to this "horological cradle", a device to relieve mothers of the tedious problems of cradle rocking, intrigued Lincoln and he took full charge of his side of the case in the examination of exhibits and drawings. The scientific and mechanical turn of the case interested him. That he argued his points well may be gathered from the fact that the court's decision, handed down later, reversed the decree of the lower courts previously rendered, in Lincoln's favor.

After the arguments in the case were completed, on his way back to his office in company with a colleague, Lincoln was explaining to him the merits of the invention. His friend ventured to ask Lincoln how the thing was stopped when once placed in motion and Lincoln replied, "There's a rub. I reckon I'll have to answer you as I did the judge who asked the same question. The thing's like some of the glib and interesting talkers you and I know; when it gets to going, it don't know when to stop."

An interesting sidelight on Lincoln's inquiring mind, his engineer's approach to the scientific and mechanical, is brought out by Herndon in describing the occasion on which he, Herndon, brought a copy of Well's *Annual of Scientific Discovery* into their office. Lincoln, who was in the office at the time, took the book, glanced through it, read a little, and then startled Herndon by announcing that he was going out immediately and purchase the entire set. He explained, "I have wanted such a book for years, because I sometimes make experiments and have thoughts about the physical world that I do not know to be true or false. I may, by this book, correct my errors and save time and expense."

This characteristic bent of mind stood him in good stead in the intricate

problems presented in the patent cases to be handled by him in association with many other outstanding figures of the nation's bar of the period.

Cyrus McCormick invented his reaper sometime in the summer of 1831. He took out patents on it and the many devices that came in the wake of his original invention. John H. Manny, of Wisconsin, sometime in 1851, produced a similar machine for harvesting grain and he, too, took out letters of patent on his product and began immediate production for sale. His machine became a serious threat to the McCormick product and in November, 1854, McCormick brought suit against Manny in an attempt to stop the further production and sale of Manny's product, which, in many instances, resembled the McCormick machine in construction parts.

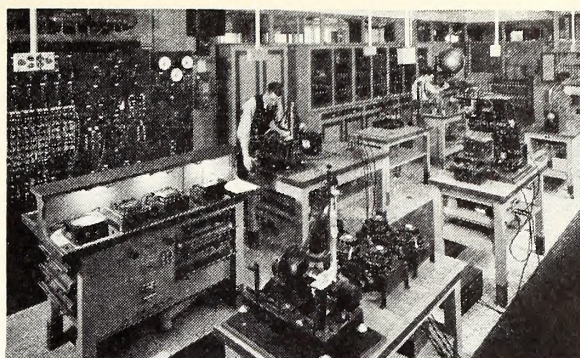
Lincoln was one of the distinguished counsel, numbering besides himself, George Harding and Edwin M. Stanton, chosen by Manny to represent him. Lincoln immediately interested himself in the case, especially in the mechanical phases and, while attending the sessions of the United States courts in Chicago during July, 1855, went to Rockford to study the Manny & Company reaper. He also consulted with Mr. P. H. Watson, of Washington, D. C., an outstanding figure in the patent attorney field, on the case.

The case, opening in Cincinnati, September 20th, 1855, before Judge McLean, was destined not to come up to the expectations of Lincoln's hopes of participation for, in spite of his intense preparation, through the machinations of Stanton, Lincoln was forced to withdraw from active participation in the court hearings and remain as purely a consultant. Stanton afterward conceded that, from the knowledge he afterward gained of Lincoln's ability, he undoubtedly was as well fitted to handle the case as were either of his two colleagues. It was a very disheartening experience for Lincoln inasmuch as he had planned on the opportunity of matching himself against such men as Reverdy Johnson and Edward M. Dickerson, counsel for McCormick.

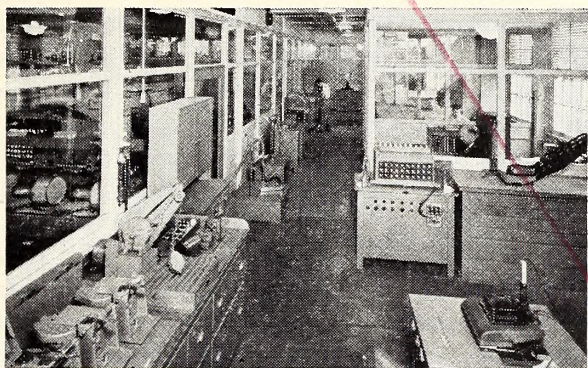
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Laboratory Facilities

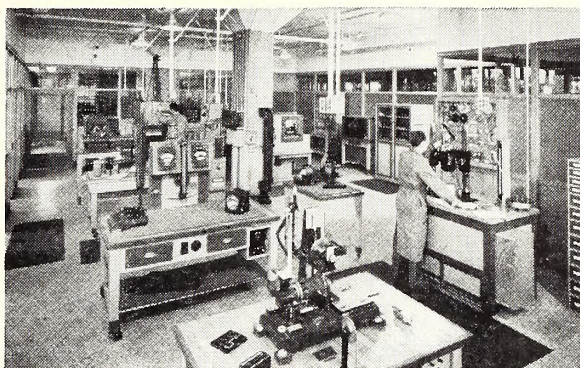
**HOOVER ENGINEERING
DEPARTMENT**



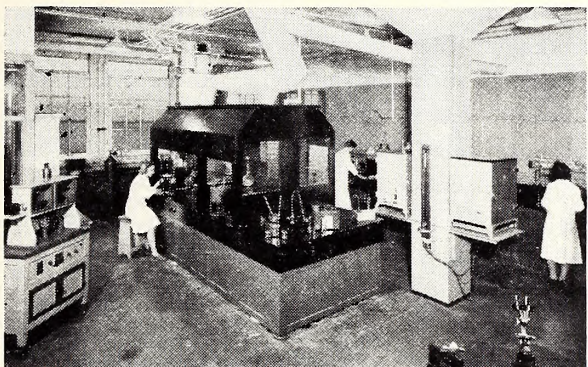
The Electrical Laboratory designs, tests and redesigns motors and component parts in developing power plants for Hoover Cleaners.



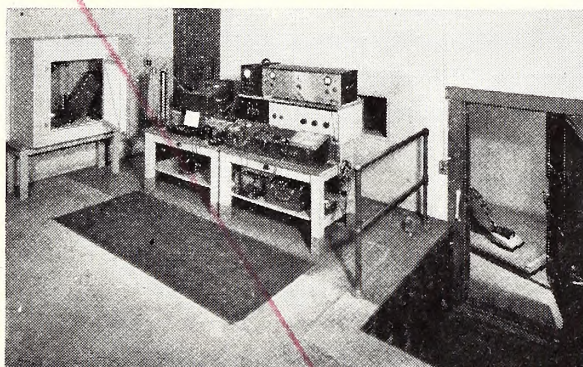
The Testing Laboratory maintains production control by acceptance tests on parts and materials. Test specifications and special test apparatus are developed here.



Filters, fans, materials, processes are tested in the Mechanical Laboratory; air flow and power problems, cleaners and cleaning methods are studied.



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(Continued from page 38)

In December, 1856, in the end of the term of the United States Circuit Court, sitting in Chicago, Lincoln was engaged by the defendants in the case of *Durfee & Green v. Sherman & Bay*. The complainants, the owners of a patent in connection with a stream dredging machine, were claiming infringement on the part of the defendants and were seeking to restrain them from operating another similar machine.

The struggle between St. Louis and Chicago commercial interests had been a long and bitter one and in May, 1856, an event occurred which brought to Lincoln the opportunity to display his talents which had been denied to him in the McCormick-Manny case. A steamboat struck one of the piers of the Rock Island bridge, was wrecked and burned. A portion of the bridge was also destroyed at the same time. This suit, *Hurd et. al. v. Railroad Bridge Company*, was more commonly known as the "Effie Afton Case," after the steamer in question.

The *Chicago Daily Democrat* of July 9th, 1857, referred to the fact that the interested parties were endeavoring to have the trial take place in the court of Judge McLean. The case created a great deal of interest in Chicago inasmuch as it was a common belief in that city that the accident was not an accident at all but a deliberate incident on the part of the St. Louis Chamber of Commerce, who felt that the course of western commerce was at stake if the bridge were allowed to stand. The Chicagoans believed that the St. Louis Chamber would go to any length to destroy the bridge. Mr. Norman B. Judd was the attorney for the railroad company and he engaged Lincoln, along with others, to act as counsel for the railroad.

The opponents of the bridge stated their argument in two phases; firstly, that the river, the great waterway for the commerce of the valley, could not legally be obstructed by a bridge; and secondly, that the particular location of this bridge, with reference to the channel of the river, made it a peril to all water craft—that it was an unnecessary obstruction.

The trial commenced in Chicago, September 8th, 1857, and ran through September 24th, with argument and counter argument. Plats and plans were prepared, models exhibited. The newspapers carried running accounts of the case and the arguments of the counsel for both sides. It is very possible that Mr. Lincoln and his colleagues made a visit to Rock Island for a first hand study of the situation as may be gathered from Lincoln's answer to a petitioner for him to speak in Iowa during the time of the trial taking place in Chicago. He says, in part, "I am engaged in a suit in the United States Court at Chicago, in which the Rock Island Bridge Company is a partner. The trial is to commence on the 8th of September, and probably will last two or three weeks. During the trial it is not improbable that all hands will come over and take a look at the bridge, and if it were possible to hit it right, I could then speak at Davenport."

Lincoln answered the first part of his opponent's argument stating, in the main, that "one man had as much right to cross the river as another had to sail up or down it." In answer to the second part of his opponent's argument, Lincoln succeeded in showing, with a careful explanation of the current of the Mississippi River at the point where the bridge crossed, that the pilot, if he were as familiar with the river as might reasonably have been expected, could have prevented the accident from occurring. His argument in this instance was marked by perfect candor but was full of nice mathematical calculations, clearly put. Lincoln had learned the meaning of the word "demonstrate".

Much has been written about Lincoln's familiarity with the Bible, a knowledge that could only connote a very close study of the various books. This knowledge was used by Lincoln to illustrate his arguments and point a moral when he so chose. A little known side of Lincoln is his short-lived career as a lecturer. In February, 1859, Lincoln was elected to honorary membership in Phi Alpha Society of Illinois College at Jacksonville, Illinois. He presented his first lecture, February

11th, under the sponsorship of the Society, at the Congregational Church in Jacksonville. His discourse was entitled, "Discoveries and Inventions," a rather dry discussion, leaning heavily on the Bible and the allusions, therein, to the development of mankind through their intellectual advancement. From his opening sentence, "All creation is a mine, and every man a miner," through the natural phenomena of the animals of the earth to man, his inventions and discoveries primarily to improve his condition, Lincoln led his audience. He ended on a note of wonderment relating to the fact that the advantageous use of steam power should be so recent a discovery in spite of the fact that the power of steam, translated into a very ingenious toy at Alexandria, in Egypt, was known by the ancients.

Lincoln must have felt encouraged by the reception of his lecture, for on February 21st, he again delivered it at Myer's Hall in Springfield. This time he had his law partner, Herndon, in the audience as a friendly critic and it was Herndon's opinion that Lincoln was not of the material that lecturers are made. At least Lincoln never attempted to carry this avocation any further after these trial attempts.

This characteristic of Lincoln's, his marked interest in things of a mechanical nature, was retained by him even in the White House. The coming war clouds, the need for armament, opened a new field for inventors. Washington was overrun with men having guns to be tested, approved, and used by the Northern soldiery.

A clerk in the Ordnance Department, during the war days in Washington, tells of meeting Lincoln in the hall of the department and receiving from him an invitation to come and test a new gun. His story had a refreshingly intimate touch as he relates that the President, "then pacing off a distance of about eighty or one hundred feet . . . raised the gun to level, took quick aim, and drove a round of seven shots in quick succession, the bullets shooting all around the target like a Gatling gun and one striking near the center." This trial did not suit the President, however, and his com-

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panion reports that he remarked that, “I can make this gun shoot better,” and whittled a wooden sight which he affixed over the sight of the carbine and proceeded to do better.

Such memoranda as the one to General Ripley, Chief of Ordnance, “Will General Ripley please consider whether this Musket-shell would be a valuable missile in battle?”, or the one to Captain, later Admiral, Dahlgren, “You have seen Mr. Blunt’s new gun—What do you think of it? Would the government do well to purchase some of them? Should they be of the size of the one exhibited, or of different sizes?” are but a few of the references, noted in Dahlgren’s diary that record Lincoln’s deep interest in ordnance, ammunition, and related matters. This close contact with Dahlgren created a deep friendship between him and the President.

Lincoln had other interests in the field of mechanics as witnessed by his memorandum to Dahlgren, “Captain Lavender wishes to show you a con-

trivance of his for discovering, and aiding to remove, under-water obstructions to vessels.” When John Ericsson approached the senators and congressmen with his plans for an ironclad vessel for war use he was rebuffed in no uncertain terms. He finally was able to make contact with President Lincoln who listened to his ideas, studied his models, encouraged him and was instrumental in having the navy accept the “Monitor” for the North. He followed the building of the craft with the deepest of interest.

President Lincoln interested himself in the experiments with the use of balloons in observation work in connection with the army. He was one of the first persons in the country to receive telegraphic messages from a balloon sent up to make observations on the enemy’s works. His encouragement of these endeavors brought about the full acceptance of this plan and the Smithsonian Institution issued a statement that “from experiments made here for the first time, it is conclusively

proved that telegrams can be sent with ease between balloon and the quarters of the commanding officer.”

Harking back to his days as a congressman in Washington is a memorandum from the President to the Secretaries of War and Navy, in February, 1863, following the great successes of the Confederates at Fredericksburg, urging the appointment of representatives to test the use of certain incendiaries as adaptable for military use.

In his Annual Message to Congress in December, 1863, President Lincoln urged upon Congress the consideration of an international telegraph across the Atlantic. This in addition to coast-wise cable service. He referred to arrangements that had been made by the government with the Czar of the Russias for the construction of a telegraph line from the Pacific Coast, through the Czar’s territory, to connect with European systems. He was in close contact with Cyrus W. Field, who was the chief exponent of the Trans-Atlantic cables.

Abraham Lincoln did not consider himself to be an authority on military matters but throughout his term he showed a practical wisdom in military affairs. His suggestions to the military authorities showed a native shrewdness, a practical sagacity that is the essence of military strategy. He instinctively grasped the salient features of the plans under consideration and could give them proper values. He, in theory, carried out the duties of the modern High Command in the survey of the war as a whole. The recognition of the fact that he had the use of superior naval strength, and made the most of it; that in dealing with a raw army, he fitted political considerations in with a strategic deployment of men; his insistence, throughout the war, that constantly maintained pressure be kept on the enemy forces; and his

recognition that the main body of the enemy, the principal objective, should always be kept in true perspective, are those functions that would come within the province of the modern High Command.

The widespread belief that Lincoln, as a youth, a country bumpkin, developed overnight into his character as a statesman; the tales of dire poverty, told out of all perspective as to his friends and neighbors, had their value in political advantages at the time, but the actual facts of the case point up an entirely different picture with the realization of Lincoln's possession of an alert mind. Knowledge, gained through patient persistence, caused Abraham Lincoln to rise, through his own efforts, from obscurity to immortality.

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ABRAHAM LINCOLN AS AN INVENTOR STILL IS IN THE FILES OF THE PATENT OFFICE

Success of His Method for Buoying Vessels Over Shoals Might Have Kept Him Out of Politics, After His Return From Congress, and Deprived the United States of One of Its Greatest Presidents.

BY CLARENCE B. WILBUR.
IN a corner of the north hall of Arts and Industries building of the United States National Museum at Washington may be seen the model of a device which its inventor believed was destined to work a revolution in steamboat navigation.

To the casual visitor, this small wooden model may appear as curious and mystifying as any modern brainchild of Buck Rogers or Rube Goldberg. Nevertheless on May 22 1849, the United States patent office, after careful examination of the model and of the inventor's claims, granted letters patent No. 6,469 on an invention for "Buoying Vessels Over Shoals."

Today, the inventor's rude model, now in custody of the Smithsonian Institution, is of interest not because of the ingenuity of its construction or because of any revolutionary engineering principle utilized, but because of the man whose hands so patiently fashioned it a century ago. So far as is known the device which the patent covers was never put to practical use, and the inventor's dream of financial return never materialized. This is fortunate. Had the invention proved to be a financial success, history might have been changed.

For the inventor and patentee was Abraham Lincoln, then of Sangamon County, Illinois. Commercial success of the device and even a comparatively modest money return from it at this period of Lincoln's life, might have deterred him from re-entering politics.

In September, 1848, Representative Lincoln returned from Washington to Illinois by the way of Niagara Falls. Crossing Lake Erie, the boat on which he had taken passage stranded on a sandbar. This was probably no new experi-

ence for Lincoln. As a young man, he had made two voyages down the Mississippi river to New Orleans. He had constructed and operated his own flat-bottomed boat on Anderson's creek at the mouth of the Ohio river, and in 1832 he had successfully piloted the first steamboat to ascend the Sangamon river from Beardstown to Springfield, Ill.

It was, therefore, with an almost professional interest that Lincoln must have watched the operation of getting the vessel off the Lake Erie sandbar. The captain ordered all hands to collect empty barrels and boxes, and these were forced under water at the sides of the craft. Their buoyancy lifted the vessel and it floated free. As Lincoln watched, an idea was born.

Immediately upon reaching home Lincoln went to work with characteristic energy and ingenuity. His aim was to construct a simple but practical device capable of becoming standard equipment on inland vessels, for emergency use in floating them over shoals. The apparatus which he invented accomplished this by a mechanical refinement of the principle which he had seen so crudely utilized on Lake Erie.

From Walter Davis, a mechanic of Springfield, Lincoln borrowed tools. At times, according to William H. Herndon, then Lincoln's law partner, he took the model of the invention to their law office and whittled away on it between clients, meanwhile holding forth on its merits.

Walter Davis worked with Lincoln on the model. Just how much work was done by Lincoln's own hand is not known. But the model appears to have been whittled or carved and put together with the minimum elaboration required to demonstrate the workability of the device to the patent authorities.

In simple language, Lincoln describes the purpose of his invention in the opening paragraph of the patent "specification":

"Be it known that I, Abraham Lincoln of Springfield, in the County of Sangamon, in the State of Illinois, have invented a new and improved manner of combining adjustable buoyant air chambers with a steamboat or other vessel for the purpose of enabling their draught of water to be readily lessened to enable them to pass over bars, or through shallow water, without discharging their cargoes."

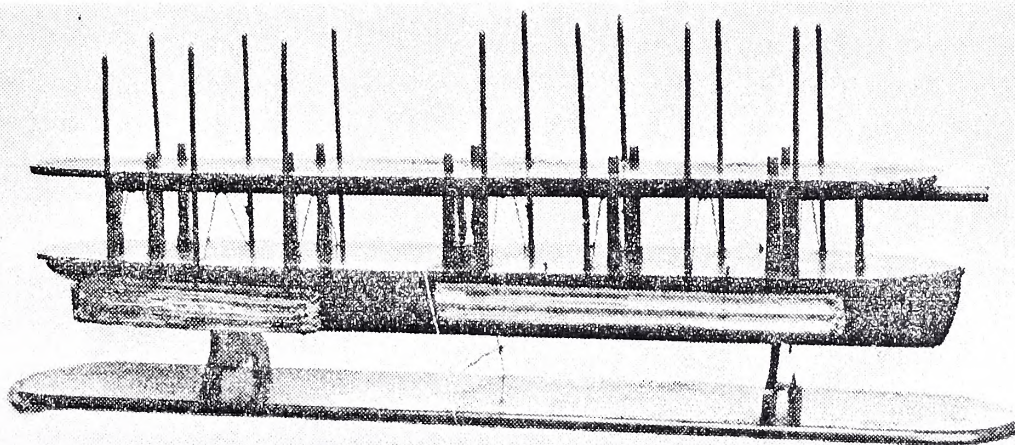
Adjustable air chambers, placed along a vessel's waterline, were to take the place of the boxes and barrels of the Lake Erie captain. This was the essence of the invention.

These air chambers could be inflated or deflated at will by means of a simple arrangement of ropes, pulleys and sliding spars operated manually, or by steam power from a main shaft to be located on the boat's deck.

"I reckon it'll work where the ground is a little damp," Lincoln humorously observed, while showing the completed model to some acquaintances.

What plans Lincoln may have had or what steps he may have taken to exploit the invention are not now known. But there is no record of any vessel's having been equipped with the device. Five years after the granting of the patent, the introduction into Congress of the Kansas-Nebraska bill with its provision for the repeal of the Missouri Compromise impelled Lincoln to re-enter politics.

By that time, Patent No. 6,469 must have been little more than the memory of another failure—another stepping-stone for the feet of the immortal inventor of Sangamon County.



ABRAHAM LINCOLN HIMSELF DID MUCH OF THE WORK OF SHAPING THIS MODEL OF HIS INVENTION FOR "BUOYING VESSELS OVER SHOALS" . . . TWO OF THE ADJUSTABLE BUOYANT CHAMBERS HE PROPOSED CAN BE SEEN ATTACHED TO THE HULL—(Photograph from Smithsonian Institution).

Lincoln an Inventor

When Americans pause briefly on the morrow to observe the anniversary of the birth of Abraham Lincoln relatively few know that, in addition to his many talents and services to humanity, he was also an inventor. The National Patent Council is authority for the statement that while serving as a congressman from Illinois, Lincoln received a patent for a "device for buoying vessels over shoals." The invention embodied a set of bellows attached to the hull of the ship below the water line. In shallow water, the bellows would fill with air to buoy up the vessel and float it clear. A wooden model of the invention whittled by Lincoln himself accompanied his patent application.

History doesn't record what Lincoln did with his invention, but the chances are that someone else capitalized on the idea and reaped a profit. That is the usual trick fate plays upon inventors.

Abraham Lincoln Gimmick Proved Helpful With 'Big Mo'

Springfield, Ill. - (U.P.) - Despite all recent technical advancements, at least one of the gimmicks used by the navy in refloating the battleship Missouri wasn't a new idea. According to one Lincoln expert,

Abraham Lincoln patented his idea for refloating ships more than 100 years ago.

Dr. Roy Basler, executive secretary of the Abraham Lincoln association, who told about Lincoln's invention said that part of the strategy used in moving the Missouri from a mudbank in Chesapeake bay Feb. 1 was placing six air filled pontoons under the hull to buoy up the ship.

Lincoln had the idea in 1849, Basler said. He thought it would be a good idea if ships had pontoons built into their sides, for use in any grounding emergency.

Lincoln got the idea when he was returning to Illinois from his first session in congress. The steamer carrying him across the Great Lakes ran aground. To ease the ship off the sandbars, the skipper had planks and empty barrels placed around and under the ship's hull.

Lincoln watched the work care-

fully. When he got back to Springfield, he worked on an idea to apply the plank and barrel theory to all ships. A skilled Illinois river boatman, he made a model containing his plan, and had it patented.

On the model, bellows were attached to each side of the hull, just below the water line. The bellows were controlled by an intricate system of ropes and pulleys. When the hull grated on sand or some other obstruction, the ropes and pulleys were to work and fill the bellows with air—giving the ship buoyancy to float over the obstruction.

Lincoln's law partner, W. H. Herndon, thought the idea was impractical, and there is no record that Lincoln ever used it on a full scale ship.

The principle involved has been incorporated in modern marine engineering. "Blisters" or air pockets on the sides of ships today are similar to Lincoln's ideas.

Some Lincoln scholars have suggested that the navy trot over to the national museum in Washington, to take a look at the model of Lincoln's invention—before building any more battleships.

Milwaukee Journal

FEB 20 1950

SMITHSONIAN INSTITUTION
UNITED STATES NATIONAL MUSEUM
WASHINGTON 25, D. C.

JAN 17 1957

Mr. R. Gerald McMurtry, Director
Lincoln National Life Foundation
Fort Wayne, Indiana

Dear Mr. McMurtry:

Your recent communication addressed to the
Smithsonian Institution
has been referred for attention to:

The Lincoln Museum
511 - 10th Street N. W.
Washington, D. C.

Any further correspondence with regard to this
subject should be sent directly to the address above.

Very truly yours,

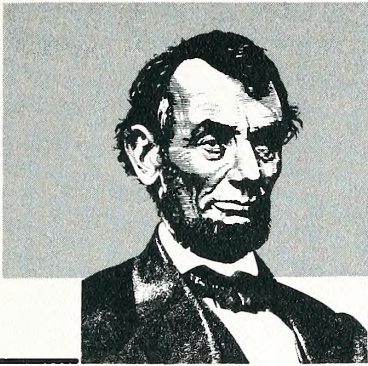


Helena M. Weiss
Registrar

Subject: Replica of wagon whittled by Lincoln

Date: December 29, 1956

SIFL-6
6-52



Lincoln Lore

Bulletin of The Lincoln National Life Foundation . . . Dr. R. Gerald McMurtry, Editor
Published each month by The Lincoln National Life Insurance Company, Fort Wayne, Indiana

Number 1439

FORT WAYNE, INDIANA

January, 1958

A. LINCOLN MANNER OF BUOYING VESSELS

No. 6,469

Patented May 22, 1849

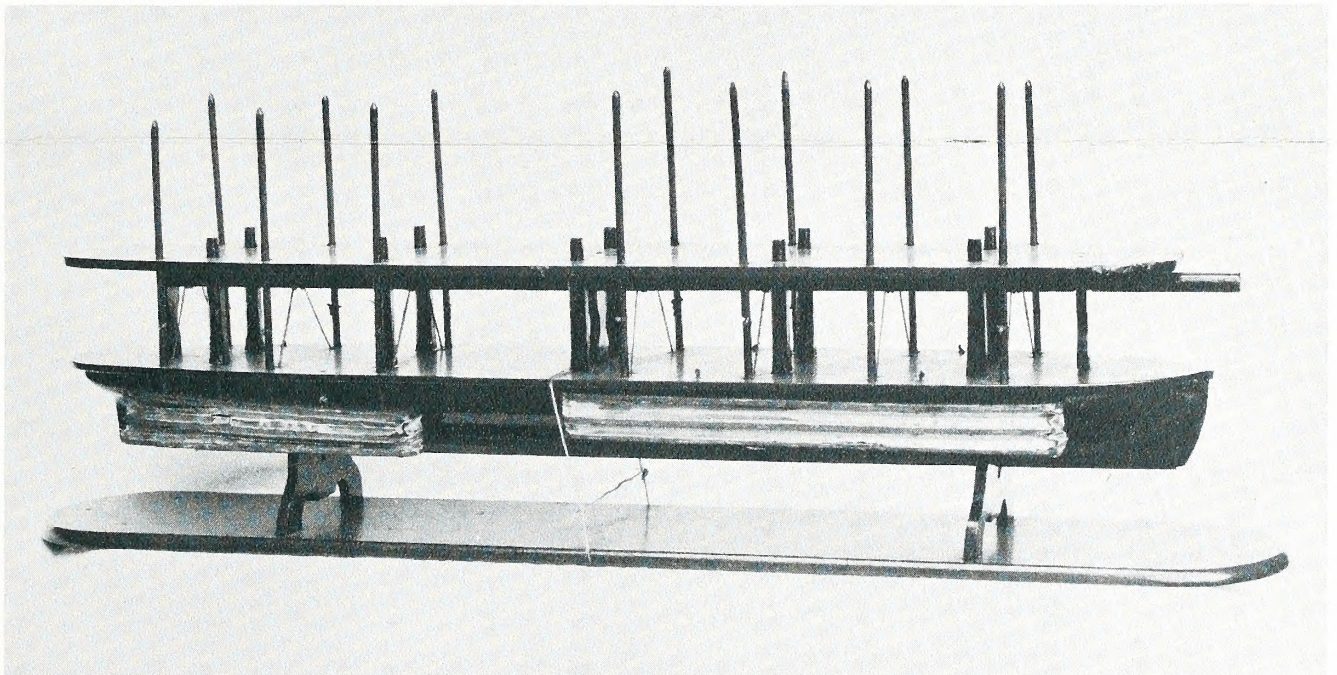
Abraham Lincoln was interested in shallow water navigation. He had considerable experience as a boatman and he knew of the many vexations and delays caused by boats being stranded for days at a time on unseen shoals in the lakes and rivers. Then, too, his six years' (1831-1837) residence at New Salem, Illinois, on the Sangamon River, had convinced him that if that stream was to become an artery of travel the vessels engaged in the river traffic would have to lift themselves over the sand bars, so to speak, by their own bootstraps.

This lesson was further demonstrated in 1848 when Congressman Lincoln traveled by steamer from Buffalo to Detroit. Enroute, the Lake Erie steamer became grounded on a sand bar. The captain, applying a simple law of physics, met the crisis. He ordered all hands to force barrels under the side of the ship below the water line. In recalling the incident it was said that "slowly but surely the boat began to rise." Lincoln watched the entire proceedings intently and the tradition further relates that "taking a piece of paper from his jacket, he sat down, placed it on top of his high hat and began to make some sketches."

Upon reaching home Lincoln determined to incorporate the same principle he had seen the ship captain employ, in an apparatus that would be soundly practicable and

readily applicable. He secured the help of Walter Davis, a mechanic who had a wood working shop near the Lincoln-Herdon law office, to help him devise a carefully finished model, that would be symmetrical in its parts. Davis had materials and tools and he assisted Lincoln in his scientific project. The device was ingenious with an odd system of pulleys, bellows, poles and ropes. Apparently Lincoln spent a lot of time on the eighteen inch model, whittling on it, scraping it with glass, rubbing it down with emery paper and all the while trying to visualize how it would revolutionize river and lake navigation. The finished product was a long and graceful river-boat, through whose outer decks, from stern to stern, on both sides, were inserted vertical poles attached at their lower ends to horizontal bellows running beneath the lower guards near the water. Lincoln estimated that one inch of the lifting power of his model's buoyant chambers would represent one foot on a regular size steamboat.

Gaines Paddock of Springfield recalled how "Abraham Lincoln came into John Williams' store on the north side of the square, which was the town's loafing place and where I was clerking during the summer and stated that he believed he had solved the problem. He declared the Sangamon River was navigable and told us all to



Patent Office model made by Abraham Lincoln and Walter Davis illustrating the method of lifting vessels over shoals, patented May 22, 1849, Number 6,469. Now exhibited at the Smithsonian Institution. See Lincoln Lore Number 843, June 4, 1945.

Feb. 28

My Dear Sir.

Mr Eubank is yet
in doubt. If the enclosed
statement of the claim
will satisfy our friends, I
have reason to think a
patent may be obtained -

Yours truly

Daniel Webster

Mr Lincoln

Daniel Webster to Mr. Lincoln
Original Letter in Western Reserve
Historical Society, Cleveland, Ohio
See Lincoln Lore, No. 889. April 22, 1946.

come over to the square the next day and he would prove his statement. Promptly at the time he had named, Lincoln walked into the place where the crowd had assembled, carrying under his arm a small boat model, which he placed in one of the public watering troughs, situated at each corner of the square. Placing bricks in the boat he sank it to the gunwalls and then using bellows blew air into compartments. As a result the boat and its load were lifted several inches higher in the water. He then explained the procedure to the people stating that if a sand bar were encountered all that need be done was to fill the compartments with air. Picking up the boat model he turned and walked away leaving the people arguing on the method of the plan."

During the early months of 1849 it is believed that Abraham Lincoln wrote Daniel Webster regarding his invention. Perhaps Lincoln may have asked Webster to interview Thomas Eubank, who was then the Commissioner of Patents, about the possibility of securing a patent for his device to lift vessels over shoals.

On February 28 (1849) Webster replied to Lincoln's inquiry: "Mr. Eubank is yet in the South. If the enclosed statement of the claim will satisfy our friends I have reason to think a patent may be obtained."

With the convening of the short session of Congress, Lincoln left Springfield on November 26, 1848 carrying his red cedar wood model to Washington with a firm determination to get his invention patented. On this trip he traveled on a steamer via Saint Louis down the Mississippi and up the Ohio. This trip undoubtedly gave him further opportunity to observe the practicability of his invention. His first step was to secure the services of a patent lawyer, Mr. Zenas C. Robbins. Robbins had formerly lived in Saint Louis and had personally observed the difficulties of shallow water navigation on the Mississippi River. Apparently Lincoln was able to make the personal acquaintance of Robbins through Elihu B. Washburne. A few days after Washburne and Lincoln had called at the home of Mr. and Mrs. Robbins the patent lawyer asserted that "Mr. Lincoln walked into my office one morning with a model of a western steamboat under his arm. After a friendly greeting he placed his model on my office table and proceeded to explain the principle embodied therein that he believed to be his own invention, and which, if new, he desired to secure

Fig. 1.

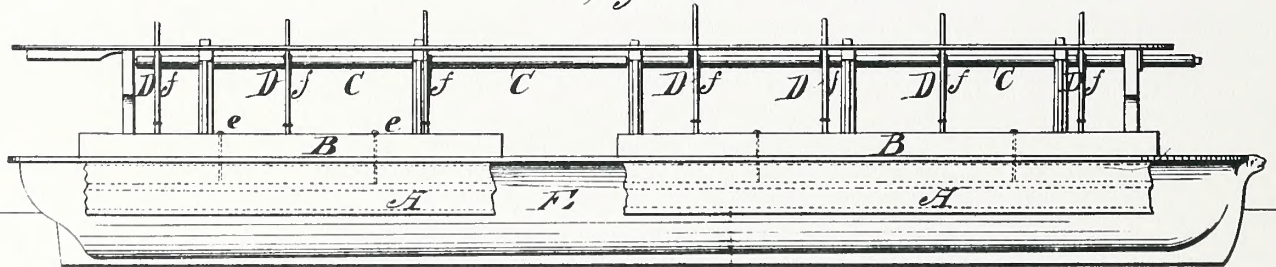


Fig. 3.

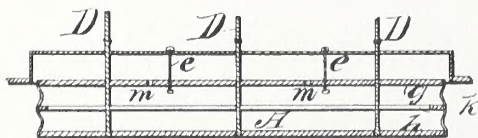
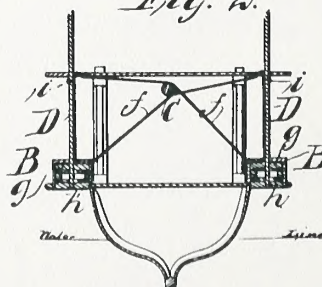
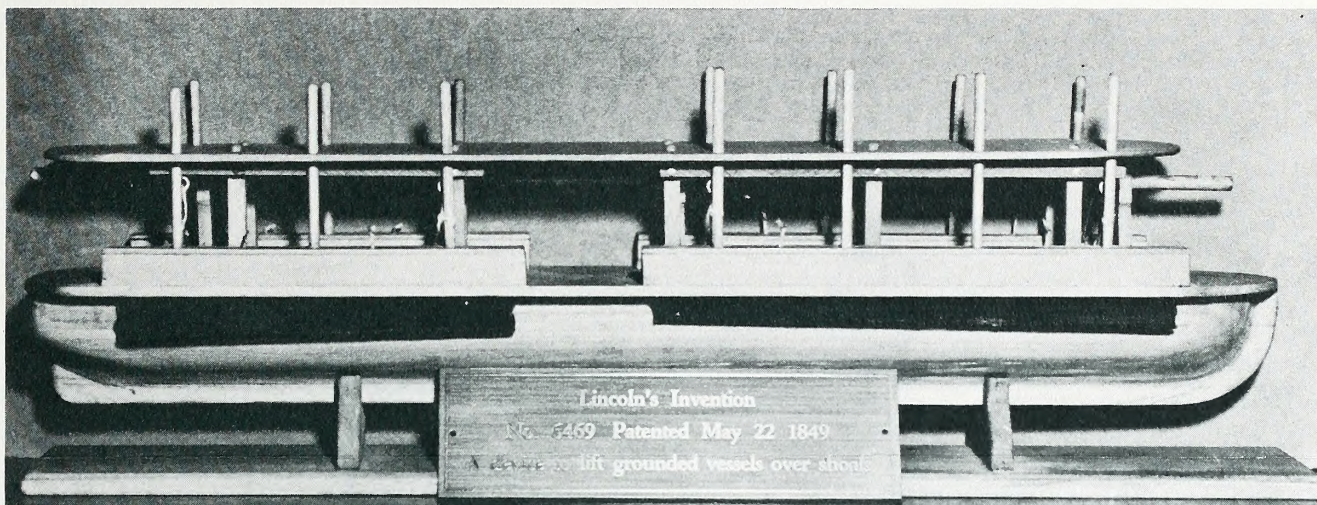


Fig. 2.



Scale drawing of Lincoln's invention showing side view and cross section.
The original drawing is now missing from the National Archives file.



Scale model of Lincoln's invention embodying all of the specifications for construction, except for the application of steam power to shaft C to inflate the air chambers. From the Carl W. Schaefer Collection.

by letter patent. During my former residence in St. Louis, I had made myself thoroughly familiar with everything appertaining to the construction and equipment of the flat-bottomed steamboats that were adapted to the shallow rivers of our Western and Southern states, and therefore, I was able speedily to come to the conclusion that Mr. Lincoln's proposed improvement of that class of vessel was new and patentable, and I so informed him. Thereupon he instructed me to prepare the necessary drawings and paper and prosecute an application for a patent for his invention at the United States Patent Office. I complied with his instructions and in due course of proceedings procured for him a patent that fully covered all the distinguishing features of his improved steamboat. The identical model that Mr. Lincoln brought to my office can be seen in the United States Patent Office. . . .

"Mr. Lincoln's invention provided for placing under the guards of the boat, buoyant chambers, expansible buoyant chambers, made of some waterproof material, with the parts so arranged and connected with the engines that when the boat got aground the whole power of the boilers could be exerted to depress these chambers, and more than double the width of the boat and of course raise the boat in the water. Then the power could be applied to the wheels and the boat could again go on its way rejoicing."

Robbins asked Lincoln to sign a copy of a printed form addressed to the Commissioner of Patents, Edmund Burke, which was filed on March 10, 1849. The words printed in italics were filled in by hand:

"Application for Patent"

on an Improved Method of Lifting Vessels over Shoals
March 10, 1849

To the Commissioner of Patents.

"The Petition of Abraham Lincoln, of Springfield in the county of Sangamon & State of Illinois Respectfully represents.

"That your petitioner has invented, a new and improved manner of combining adjustable buoyant chambers with steam boats or other vessels which has not, as he verily believes been heretofore used or known, and that he is desirous that Letters Patent of the United States may be granted to him therefor, securing to him and to his legal representatives, the exclusive right of making and using, and of vending to others the privilege to make or use, the same, agreeably to the provisions of the Acts of Congress in that case made and provided, he having paid thirty dollars (Robbins later recalled that Lincoln paid \$50, of which \$20 may have been the patent attorney's fee) into the Treasury of the United States, and complied with other provisions of the said Acts.

"And he hereby authorizes and empowers his Agent and Attorney, Z. C. Robbins, to alter or modify the within

specification and claim as he may deem expedient, and to receive his patent; and also to receive back any moneys which he may be entitled to withdraw, and to receipt for the same.

A. Lincoln."

The required oath was administered by I. L. Smith, a justice of the peace: "On this 10th, day of March 1849 before the subscriber, a *Jus Peace* in and for the said county personally appeared the within named *Abraham Lincoln* and made solemn oath according to law, that he believes himself to be the original and first inventor of the within described improved manner of combining buoyant chambers with steam boats or other vessels and that he does not know or believe that the same has been before used or known; and that he is a citizen of the United States.

I. L. Smith, JP"

(To be continued in the February, 1958 issue.)

McMurtry's Speaking Itinerary

Amarillo, Texas, Jan. 8, 9, 10, 1958.

El Paso, Jan. 13, 14.

San Antonio, Jan. 16, 17.

Corpus Christi, Jan. 20, 21.

Houston, Jan. 22, 23.

Beaumont, Jan. 24, 27.

Dallas, Jan. 28, 29.

Fort Worth, Jan. 30, 31.

*Cleveland, Ohio, Feb. 6.

*Philadelphia, Pa., Feb. 8.

Minneapolis, Minn., Feb. 10.

Madison, Wis., Feb. 11, 12.

Milwaukee, Feb. 13, 14.

*Chicago, Ill., Feb. 18, 19.

Peoria, Feb. 20, 21.

Toledo, Ohio, Feb. 25, 26, 27.

Dayton, March 3, 4.

Columbus, March 5, 6, 7.

The persons who might be interested in learning of the schedule in detail in the various cities named above, may contact the general agency offices of the Lincoln National Life Insurance Company.

*Special engagements not arranged by general agent.

Specifications and Drawings

Specifications and scale drawings forming part of Letters patent No. 6,469, dated May 22, 1849, application filed March 10, 1849, Abraham Lincoln, manner of Buoying Vessels, may be secured from Department of Commerce, United States Patent Office, Washington, 25, D. C., for twenty-five cents.

CUMULATIVE BIBLIOGRAPHY—1957

Selections approved by a Bibliography Committee consisting of the following members: Arnold Gates, 288 New Hyde Park Road, Garden City, N. Y.; Carl Haverlin, 2 Masterson Road, Bronxville, N. Y.; E. B. Long, 708 North Kenilworth Ave., Oak Park, Ill.; Richard F. Luffin, 45 Milk Street, Boston, 9, Mass.; Robert L. Kincaid, Lincoln Memorial University, Harrogate, Tenn.; Ralph G. Newman, 18 East Chestnut Street, Chicago 11, Ill.; William H. Townsend, 310 First National Bank Bldg., Lexington 3, Ky.; and Clyde C. Walton, Jr., Illinois State Historical Library, Springfield, Ill.

New items available for consideration may be sent to the above addresses or to the Lincoln National Life Foundation.

RIDDLE, DONALD W.

1957-25

Congressman/Abraham/Lincoln. Donald W. Riddle/University of Illinois Press, Urbana, 1937.
Book, cloth, 6¼" x 9¼", vii pp., 280 pp., price \$4.50.

NEWMAN, RALPH G.

1957-26

Picture Guide Book of New Salem State Park/Lincoln's New Salem, Illinois/(beardless photo)/(sketch of post office)/First Berry-Lincoln Store/Now U. S. Post Office/Lincoln's New Salem, Illinois/Abraham Lincoln served as postmaster of New Salem from May 7, 1833 to May 30, 1836/(Cover title).
Pamphlet, paper, 8" x 5¼", (18) colored photographs by Curt Teich & Co., Inc., (12) pages of explanatory material, (1) map & explanation by Ralph G. Newman, price 50c.

D'AULAIRE, INGRI & PARIN, EDGAR

1957-27

Abraham/Lincoln/(drawing)/by Ingri & Edgar Parin D'Aulaire/Doubleday & Company, Inc., Garden City, New York/ (Copyright (C) 1939, 1957, by Doubleday & Company, Inc. All rights reserved. Lithographed in the United States of America.
Brochure, stiff boards, linen back-strip, 9¼" x 12½", unpag., illustrations in color, price \$3.00.

SCOTT, HUGH

1957-28

Another reminder of Lincoln/The Loyal Legion Library/Museum on Pine street has famous/collection on Civil War President/Copyright photographs and text reproduced by special permission of The Philadelphia Inquirer and gratefully acknowledged/By Hugh Scott/(Caption title).
Folder, paper, 10½" x 13", (4) pp., illus.

SHELTON, HARRIET M.

1957-29

Abraham / Lincoln/Returns/by Harriet M. Shelton/The Evans Publishing Company/New York City—1957.
Book, cloth 5¾" x 8½", xiii, 232 pp., fr., price \$3.95.

WILLIAMS, T. HARRY

1957-30

Abraham Lincoln/Selected Speeches/Messages, and Letters/(sketch of Lincoln)/Edited with an introduction and/notes by T. Harry Williams/New York Rinehart & Co., Inc./Toronto.
Book, flexible boards, 5" x 7½", xxi, 290 pp., price 75c.

LINCOLN MEMORIAL UNIVERSITY

1957-31

Lincoln Memorial University Press/Spring 1957/Vol. 59, No. 1/ Lincoln Herald/A Magazine devoted to historical research in the field of Lincolniana and the Civil War, and to the promotion of Lincoln Ideals in American Education.
Pamphlet, flexible boards, 7" x 10", 44 pp., ill.

GUNDERSON, ROBERT G.

1957-32

Reprinted from the Journal of Southern History/Volume XXII, November 1956, Number 4/William C. Rives and the "Old Gentlemen's Convention"/by Robert G. Gunderson/(Caption title).
Pamphlet, paper, 6¼" x 9½", 459-476 pp.

HOUSER, MARTIN LUTHER

1957-33

Lincoln's Education/and other Essays/by/M. L. Houser/Bookman Associates/New York.
Book, cloth, 5½" x 8¾", 356 pp., fr., price \$4.00.

INDIANA, DEPARTMENT OF CONSERVATION

1957-34

Lincoln State Park/and Nancy Hanks Lincoln State Memorial/Lincoln City, Indiana/Established 1932/1,540 Acres/(Caption title).
Folder, paper, 6" x 9", (4) pp., illus.

HOLT, HALLIE M.

1957-35

The President/(sketches)/The Strange Destiny of Lincoln/The Railsplitter/(sketch)/(Cover title).
Pamphlet, paper, 5½" x 8½", (12) pp., illus., The Sangamon Press, Springfield, Illinois.

LINCOLN MEMORIAL UNIVERSITY

1957-36

Lincoln Memorial University Press/Summer 1957/Vol. 59, No. 2/Lincoln Herald/A Magazine devoted to historical research in the field of Lincolniana and the Civil War, and to the promotion of Lincoln Ideals in American Education.
Pamphlet, flexible boards, 7" x 10", 36 pp., illus.

(NIMTZ, F. JAY)

1957-37

85th Congress/1st Session/H. J. Res. 351/In the Senate of the United States/August 21, 1957/Read twice and referred to the Committee on the Judiciary/Joint Resolution/To establish a Lincoln Sesquicentennial Commission/(Caption title).
Pamphlet, paper 7½" x 11", 7 pp.

UNITED STATES

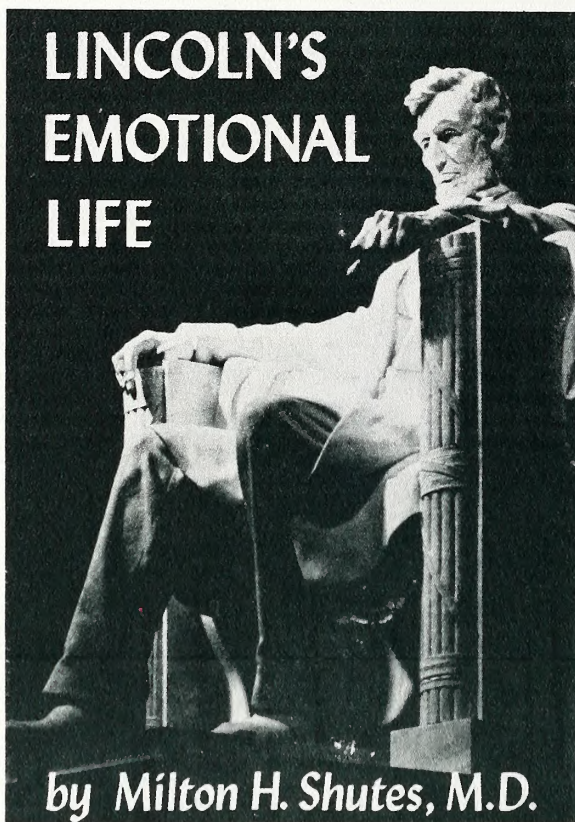
1957-38

Public Law 85-262/85th Congress, H. J. Res. 351/September 2, 1957/Joint Resolution 71 Stat. 587./To establish a Lincoln Sesquicentennial Commission/(Caption title).
Folder, paper, 6" x 9", 3 pp.

SHUTES, MILTON H.

1957-39

Lincoln's, Emotional Life/By/Milton H. Shutes, M. D./ (device)/Dorrance & Company/Philadelphia.
Book, cloth, 5¼" x 7½", 222 pp., fr., price \$3.00.

**WORKMAN, DONNA E.**

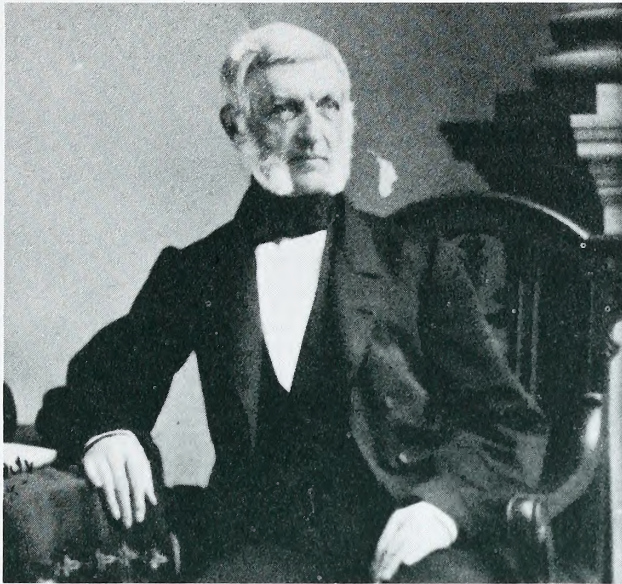
1957-40

Abraham Lincoln said: . . . /Carl Sandburg says: . . . / (Caption title).
Folder, paper, one sheet 11" x 19" folded to make 4 sides of printed material. Contains: Greetings and a foreword by the author, 1 double page of quotations by Lincoln, and 1 double page of quotations by Sandburg.

LINCOLN NATIONAL LIFE FOUNDATION

1957-41

Lincoln Lore/Bulletin of the Lincoln National Life Foundation/Dr. R. Gerald McMurtry, Editor/Published each month by The Lincoln National Life Insurance Company, Fort Wayne, Indiana/Number 1436 October 1957—Number 1438 December 1957/(Caption title).
Folder, paper, 8½" x 11", 4 pp., illus. Number 1436, National Politics—December 1860 . . . ; 1437, Some Correspondence Regarding a Missing Copy of the Gettysburg Address . . . ; 1438, " . . . It Is Not Very Probable Illinois Will Go For Taylor" . . .



From the Meserve Collection

George Bancroft From an original negative by Brady

UPRISING OF THE PEOPLE

It is the glory of the late president that he had perfect faith in the perpetuity of the Union. . . . Whatever there was of truth and faith and public love in the common heart broke out with one expression. The mighty winds blew from every quarter to fan the flame of the sacred and unquenchable fire.

THE WAR A WORLD-WIDE WAR

For a time the war was thought to be confined to our own domestic affairs; but it was soon seen that it involved the destinies of mankind; its principles and causes shook the politics of Europe to the center, and from Lisbon to Peking divided the Governments of the world.

GREAT BRITAIN

But its Government was become a Government of land, and not of men; every blade of grass was represented, but only a small minority of the people.

HER SENTIMENTS

They had not one word of sympathy for the kind-hearted poor man's son whom America had chosen for her chief; they jeered at his large hands and long feet and ungainly stature; and the British Secretary of State for Foreign Affairs made haste to send word through the palaces of Europe that the great Republic was in its agony, that the Republic was no more, that a head-stone was all that remained due by the law of nations to "the late Union."

HER POLICY

The Prime Minister in the House of Commons, sustained by cheers, scoffed at the thought that their laws could be amended at our request so as to preserve real neutrality; and to remonstrances now owned to have been just, their Secretary answered that they could not change their laws *ad infinitum*.

RELATIONS WITH ENGLAND

. . . but the best bower anchor of peace was the working class of England, who suffered most from our civil war, but who, while they brole their diminished bread in sorrow, always encouraged us to persevere.

NOTE: "The British minister in Washington thought the speech hostile and unfriendly, and on the 28th of the month Lord John Russell called at the American Embassy in London to lodge a formal note of protest. When Russell had been British Secretary of State for Foreign Affairs, Bancroft told Congress, he viewed the United States as 'the late Union,' and he had made haste to spread his opinion of it as such throughout Europe, hampering Lincoln's diplomatic efforts a great deal. Adams wrote in some concern to the historian, begging him to explain or to retract his remarks. 'As for the British,' replied Bancroft, 'if he had heard anything which displeased him he had only himself to blame; knowing that the gentleman might be present at the session, he had asked Seward to request him not to come.' Citing Russell's own official correspondence during 1861 the speaker proved that the Secretary had used the word 'late' four times in referring to the Union, and with a touch of arrogance, he told Adams, 'Pray send Lord Russell a copy of this letter, which he is at liberty to publish, and I consider myself equally at liberty to publish his letter, to which this is a reply. Nothing more was heard from Lord Russell.'" Russel B. Nye: *The Biography of George Bancroft*, page 234.

FRANCE AND THE MONROE DOCTRINE

The policy regarding further colonization of America by European Powers, known commonly as the doctrine of Monroe, had its origin in France; and, if it takes any man's name, should bear the name of Turgot.

THE EMPEROR NAPOLEON AND MEXICO

. . . word was brought us, in the moment of our deepest affliction, that the French emperor, moved by a desire to erect in North America a buttress for imperialism, would transform the republic of Mexico into a secundo-geniture for the house of Hapsburg . . . so that the imperial system of Mexico, which was forced at once to recognize the wisdom of the policy of the republic by adopting it, could prove only an unremunerating drain on the French treasury for the support of an Austrian adventurer.

NOTE: "Bancroft, protested the Austrian Minister Baron von Wydenbruck, referred to Emperor Maximilian of Mexico as an 'adventurer.' Was it not true, replied the State Department with delicate irony, that in 1846 Austria declared itself completely uninterested in Mexican affairs." Russel B. Nye: *The Biography of George Bancroft*, page 234.

THE PERPETUITY OF REPUBLICAN INSTITUTIONS

A free State once truly constituted should be as undying as its people; the republic of Mexico must rise again.

THE POPE OF ROME AND THE REBELLION

The blessing of the Pope of Rome on the head of Duke Maximilian could not revive in the nineteenth century the ecclesiastical policy of the sixteenth; and the result is only a new proof that there can be no prosperity in the State without religious freedom.

THE PEOPLE OF AMERICA

The President was led along by the greatness of their self-sacrificing example; and as a child, in a dark night on a rugged way, catches hold of the hand of its father for guidance and support, he clung fast to the hand of the people, and moved calmly through the gloom.

THE EMANCIPATION PROCLAMATION

After vain resistance, Lincoln, who had tried to solve the question by gradual emancipation, by colonization, and by compensation, at last saw that slavery must be abolished or the Republic must die; and on the 1st day of January, 1862, he wrote liberty on the banners of the armies.

RUSSIA AND CHINA

Russia, whose emperor had just accomplished one of the grandest acts in the course of time by raising twenty million bondmen into freeholders, and thus assuring the growth and culture of a Russian people, remained our unwavering friend. From the oldest abode of civilization, which gave the first example of an imperial government with equality among the people, Prince Kung, the Secretary of State for Foreign Affairs, remembered the saying of Confucius, that we should not do to others what we would not that others should do to us, and in the name of the Emperor of China closed its ports against the war ships and privateers of "the seditious."

CONTINUANCE OF THE WAR

The war continued, with all the peoples of the world for anxious spectators. Its cares weighed heavily on Lincoln, and his face was plowed with the furrows of thought and sadness. With malice toward none, free from the spirit of revenge, victory made him importunate for peace; and his enemies never doubted his word or despaired of his abounding clemency.

LINCOLN'S ASSASSINATION

And at the moment of the height of his fame, to which his humility and modesty added charms, he fell by the hand of the assassin; and the only triumph awarded him was the march to the grave.

THE GREATNESS OF MAN

Not in vain has Lincoln lived, for he has helped to make this Republic an example of justice, with no caste but the caste of humanity.

THE JUST DIED FOR THE UNJUST

When I think of the friends I have lost in this war—and every one who hears me has, like myself, lost some of those whom he most loved—there is no consolation to be derived from victims on the scaffold, or from anything but the established union of the regenerated nation.

CHARACTER OF LINCOLN

The habits of his mind were those of meditation and inward thought, rather than of action. He excelled in logical statement, more than in executive ability. He reasoned clearly, his reflective judgment was good, and his purposes were fixed; but, like the Hamlet of his only poet, his will was tardy in action; and for this reason, and not from humility or tenderness of feeling, he sometimes deplored that the duty which devolved on him had not fallen to the lot of another. He was skillful in analysis; discerned with precision the central idea on which a question turned, and knew how to disengage it and present it by itself in a few homely, strong old English words that would be intelligible to all. He delighted to express his opinions by an apothegm, illustrate them by a parable, or drive them home by a story.

PALMERSTON AND LINCOLN

Palmerston is a shining example of the ablest of a cultivated aristocracy; Lincoln is the genuine fruit of institutions where the laboring man shares and assists to form the great ideas and designs of his country.

CONCLUSION

As the sum of all, the hand of Lincoln raised the flag; the American people was the hero of the war; and therefore the result is a new era of republicanism.

The memorial service which began at 12:30 p.m. came to an end at 3:25 p.m. when the Rev. Dr. Gray, Chaplain of the Senate gave the benediction. Then the members of the Senate, preceded by the president *pro tempore*, retired from the Hall and the Speaker of the House called the House of Representatives to order. Mr. Washburne, of Illinois, presented the only item of the agenda; a resolution of thanks to Hon. George Bancroft for "the appropriate memorial address" and "that he be requested to furnish a copy for publication." And then, on motion of Mr. Washburne of Illinois (at 3:35 o'clock) the House adjourned.

A. Lincoln

Manner of Buoying Vessels

(Continued from the January, 1958 Issue)

The specifications for Lincoln's patent follow:

"To all whom it may concern:

"Be it known that I, Abraham Lincoln of Springfield, in the County of Sangamon, in the State of Illinois have invented a new and improved manner of combining ad-

justable buoyant air chambers with a steamboat or other vessel for the purpose of enabling their draught of water to be readily lessened to enable them to pass over bars, or through shallow water, without discharging their cargoes; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings making a part of this specification. Similar letters indicate like parts in all the figures.

"The buoyant chambers A, A, which I employ, are constructed in such a manner that they can be expanded so as to hold a large volume of air when required for use, and can be contracted, into a very small space and safely secured as soon as their services can be dispensed with.

"Fig. 1, is a side elevation of a vessel with the buoyant chambers combined therewith expanded;

"Fig. 2, is a transverse section of the same with the buoyant chambers contracted.

"Fig. 3, is a longitudinal vertical section through the centre of one of the buoyant chambers, and the box B, for receiving it when contracted, which is secured to the lower guard of the vessel.

"The top *g*, and bottom *h*, of each buoyant chamber, is composed of plank or metal, of suitable strength and stiffness, and the flexible sides and ends of the chambers, are composed of india-rubber cloth, or other suitable water-proof fabric, securely united to the edges and ends of the top and bottom of the chambers.

"The sides of the chambers may be stayed and supported centrally by a frame *k*, as shown in Fig. 3, or as many stays may be combined with them as may be necessary to give them the requisite fullness and strength when expanded.

"The buoyant chambers are suspended and operated as follows: A suitable number of vertical shafts or spars D, D, are combined with each of the chambers, as represented in Figs. 2 and 3, to wit: The shafts work freely in apertures formed in the upper sides of the chambers, and their lower ends are permanently secured to the under sides of the chambers: The vertical shafts or spars (D, D,) pass up through the top of the boxes B, B, on the lower guards of the vessel, and then through its upper guards, or some other suitable support, to keep them in a vertical position.

"The vertical shafts (D, D,) are connected to the main shaft C, which passes longitudinally through the centre of the vessel—just below its upper deck—by endless ropes *f*, *f*, as represented in Fig. 2: The said ropes, *f*, *f*, being wound several times around the main shaft C, then passing outwards over sheaves or rollers attached to the upper deck or guards of the vessel, from which they descend along the inner sides of the vertical shafts or spars D, D, to sheaves or rollers connected to the boxes B, B, and then rise to the main shaft (C,) again.

"The ropes, *f*, *f*, are connected to the vertical shafts at *i*, *i*, as shown in Figs. 1 and 2. It will therefore be perceived that by turning the main shaft C, in one direction, the buoyant chambers will be expanded into the position shown in Fig. 1; and by turning the shaft in and opposite direction, the chambers will be contracted into the position shown in Fig. 2.

"In Fig. 3, *e*, *e*, are check ropes, made fast to the tops of the boxes B, B, and to the upper sides of the buoyant chambers; which ropes catch and retain the upper sides of the chambers when lower sides are forced down, and cause the chambers to be expanded to their full capacity. By varying the length of the check ropes, the depth of immersion of the buoyant chambers can be governed. A suitable number of openings *m*, *m*, are formed in the upper sides of the buoyant chambers, for the admission and emission of air when the chambers are expanded and contracted.

"The ropes *f*, *f*, that connect the main shaft C, with the shafts or spars D, D, (rising from the buoyant chambers,) may be passed from one to the other in any direction that may be deemed best, and that will least incommode the deck of the vessel; or other mechanical means may be employed as the medium of communication between the main shaft and the buoyant chambers, if it should be found expedient.

"I shall generally make the main shaft C, in as many parts as there are corresponding pairs of buoyant chambers, so that by coupling the sections of the shaft

together, the whole of the chambers can be expanded at the same time, and by disconnecting them, either pair of chambers can be expanded, separately from the others as circumstances may require.

"The buoyant chambers may be operated by the power of the steam engine applied to the main shaft C, in any convenient manner, or by man power.

"Where the guards of a vessel are very high above the water, the boxes B, B, for the reception of the buoyant chambers when contracted, may be dispensed with, and the chambers be contracted by drawing them against the under side of the guards. Or, protecting cases may be secured to the under sides of the guards for the reception of the buoyant chambers when contracted.

"When it is desired to combine my expansible buoyant chambers with vessels which have no projecting guards; shelves or cases must be strongly secured to their sides for the reception of the buoyant chambers.

"I wish it to be distinctly understood, that I do not intend to limit myself to any particular mechanical arrangement, in combining expansible buoyant chambers with a vessel, but shall vary the same as I may deem expedient, whilst I attain the same end by substantially the same means.

"What I claim as my invention and desire to secure by letters patent, is the combination of expansible buoyant chambers placed at the sides of a vessel, with the main shaft or shafts C, by means of the sliding spars or shafts D, which pass down through the buoyant chambers and are made fast to their bottoms, and the series of ropes and pulleys, or their equivalents, in such a manner that by turning the main shaft or shafts in one direction, the buoyant chambers will be forced downwards into the water and at the same time expanded and filled with air for buoying up the vessel by the displacement of water; and by turning the shaft in an opposite direction, the buoyant chambers will be contracted into a small space and secured against injury.

A. Lincoln.

Witness:

Z. C. Robbins,
H. H. Sylvester."

The original Lincoln model does not embody all of the features noted in the specifications. For example, no provision is made in the original model for the application of "the power of the steam engine applied to the main shaft C," to expand the buoyant chambers. Likewise, the boxes B, B, for the reception of the buoyant chambers when contracted, do not appear on Lincoln's original model. However, Lincoln explained that the buoyant chambers could be expanded manually and that boxes for the buoyant chambers could be dispensed with if they were contracted and drawn against the under side of the guards.

The specifications for Lincoln's patent were published in 1850 in the "Report of the Commissioner of Patents for The Year 1849. Part I, Arts and Manufactures, Washington: Office of printers to House of Representatives. 1850." Lincoln's invention is described on page 262.

Lincoln's patent was for a period of fourteen years, expiring in the year 1863, without renewal. For a period of time the "western steamboat" was exhibited by the patent office, in a case designated as "Marine", and when Lincoln was installed as the Sixteenth President it is related that he had a messenger locate the model and bring it to the White House. Perhaps Lincoln derived a great deal of pleasure in seeing once against the model and exhibiting it before his friends. Later it was placed more conspicuously on exhibit in what was then known as the "Washington Case" at the patent office. Today the ship model is prominently displayed at the Smithsonian Institution.

When Lincoln applied for this patent the best mode of travel was by boat and the population of the nation was largely centered along the narrow fringe of the ocean and on navigable rivers. Railroads soon diverted traffic from the rivers, and Lincoln got involved deeper than ever into law and politics. Attorney Z. C. Robbins was of the opinion that Lincoln never received as much as a dollar for his patent number 6,469 "Improved Method of Lifting Vessels Over Shoals."

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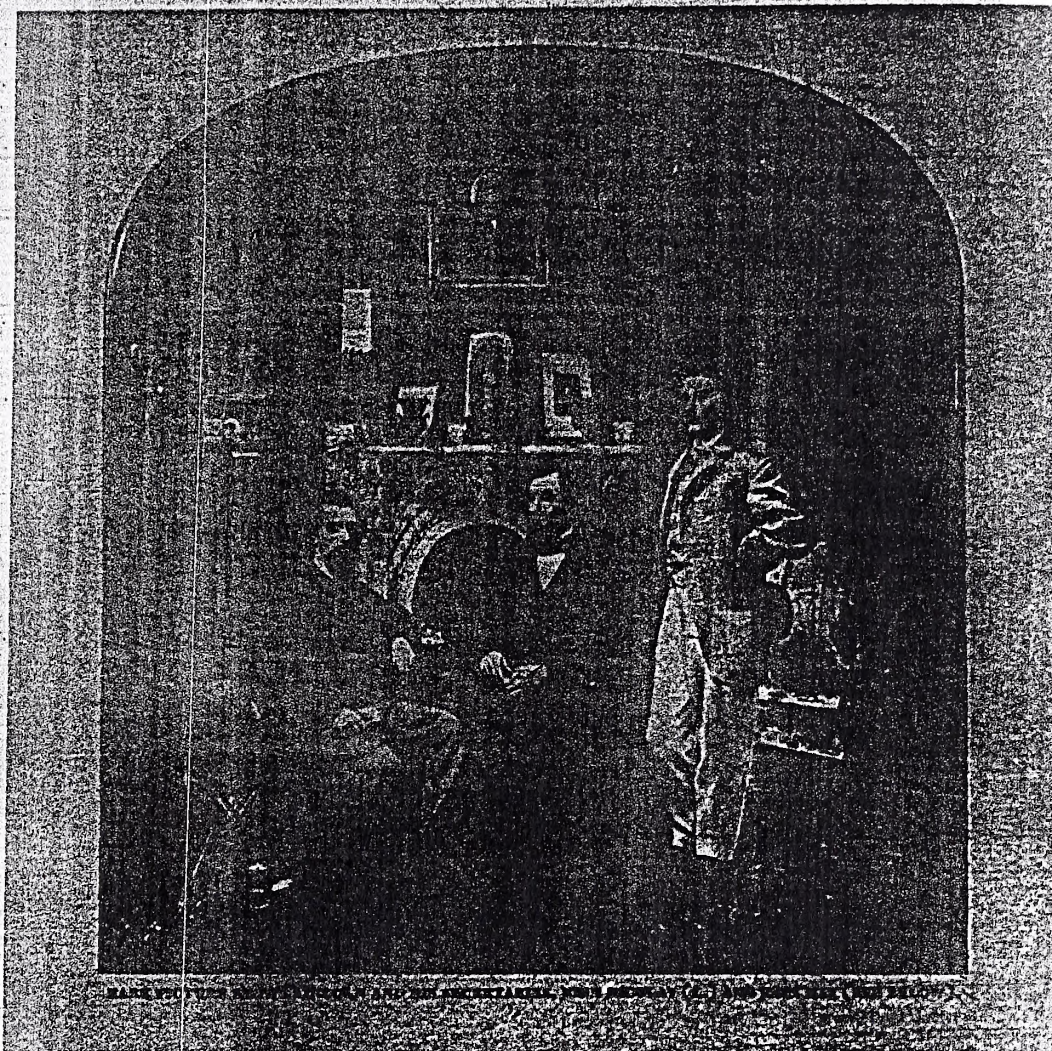
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ABE LINCOLN—

He was a scientist ahead of his time

by FRED BLUMENTHAL

Parade Washington correspondent

One day in 1848, the town loafers of Springfield, Ill., gathered around a public watering trough on Court House Square to watch an odd demonstration.

Afloat in the trough was a scale model of a riverboat, and a tall gaunt man—a local lawyer named Abraham Lincoln—was hilling it with bricks. As the model sank, Lincoln began to manipulate a system of poles along the gunwales. The poles, he explained, worked a bellows that filled compartments with air and enabled the boat to lift itself in the water.

The loafers peered intently. Sure enough, the boat was inching upward. They broke into an argument over the invention's practicality. Lincoln, his demonstration over, whisked the model under his arm and strode away.

This was the first public unveiling of an invention called, in its patent papers, "manner of buoying vessels over shoals." Inventor Abraham Lincoln never patented another, but he remained a devotee of technology and invention all his life.

This year, the 150th anniversary of Lincoln's birth (see page 28), Lincoln scholars are showing new interest in Lincoln the gadgeteer and man of science.

Continued on page 28

An historic photograph

The photo above, taken in Alexander Gardner's studio in 1863, is a unique prize. Its background was painted in later to show Lincoln's cabinet room in Civil War days, and is one of a few extant records of this war nerve center. At the tall desks the secretaries worked. At the map stand at right Lincoln followed the war's course. Long in private hands, the photo recently was given anonymously to Brown University.

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LINCOLN continued

His inventor's mind helped make him a great President

Looking back from a science-minded age, they find Lincoln a scientific thinker far ahead of his time.

Lincoln's boat-"lifter" never passed the patent stage. But in losing a second-rate inventor, the nation gained an immortal President. One reason for Lincoln's great success in the White House was his inventor's mind.

Recently, in *Lincoln and the Tools of War*, Robert V. Bruce told how Lincoln battled for better weapons for Union troops. His door was always open to inventors. He saw the value of such suggestions as the first crude submarine and the Gatling gun. He fought a running battle with War Department obstructionists to win a fair trial for new ideas.

Rockets and Flame-Throwers

Bruce and other scholars say Lincoln:

- Was responsible for introducing machine guns and breech-loading rifles to the Union Army.

- Set up a secret project for a new explosive.

- As early as 1848, advocated Army tests for a new flame-thrower.

- Supported tests for mines, submarines, rockets and other modern weapons.

- At least once personally tested a new breech-loading rifle.

- Made speeches pointing to the importance of inventions and discoveries.

- May have invented a wagon axle foreshadowing today's auto axle.

- Made a special study of geology and other sciences.

Lincoln had no formal scientific training. (He "went to ABC schools by littles," he once said.) Yet Dr. Joseph Henry, head of the Smithsonian and a top scientist in the 1860s, marveled at his grasp of scientific matters. Though essentially a practical man, Lincoln also was interested in Henry's pure, what-makes-the-grass-green research.

Lincoln once said he had made it a lifelong practice to "Inquire into the nature of things." He had, he said, cultivated "the habit of invention—the habit of observation and reflection." In a speech on "Inventions and Discoveries," he traced the world's history as a series of inventions.

A fellow lawyer once described Lincoln

"observing" a new piece of farm machinery: "He would carefully examine it all over, first generally and then critically; he would 'sight' it to determine if it was straight or warped; if he could make a practical test of it, he would do that; he would turn it over or around and stoop down, or lie down, if necessary, to look under it; he would examine it closely, then stand off and examine it at a little distance; he would shake it, lift it, roll it, upend it, overset it and thus ascertain every quality and utility which inhered in it, so far as acute and patient investigation could do it."

Lincoln's training in observation and reflection led to his boat-"lifter." Two amateur Lincoln buffs, Thomas D. Starr and Arthur M. Smith of Detroit, have traced down the story. The inspiration, Starr and Smith say, came to him during a steamer trip through the Detroit River from Buffalo to Chicago.

Off Fighting Island, Lincoln, aboard the *Globe*, watched the steamer *Canada* pile up on a shoal. Lincoln, an ex-riverman who once went aground on New Salem Dam, watched as seamen forced barrels and rasks under the ship to increase its buoyancy. Taking out a piece of paper, he placed it on top of his high hat and began sketching.

Lincoln's Other Invention

Back in Springfield, he enlisted the aid of a mechanic-woodworker, Walter Davis, to help him build a model of his idea. When he went back to Congress, he applied for, and received, Patent No. 6469.

While this was Lincoln's only patent, he is credited with another invention—possibly conceived even before. In early farm wagons, the front axle pivoted on turns, making them dangerously prone to tip over. In the invention believed to be Lincoln's, each front wheel turned on its own spindle, as in today's auto steering.

A model of this wagon, rescued from a Patent Office housecleaning, is in the Ford Theater Museum, Washington. No record tying it to Lincoln has been found. If the idea were Lincoln's, it certainly was far ahead of its time, for the idea was not patented until well after the Civil War.

Lincoln's patent expired in 1863, but

by then he was more interested in other people's inventions. He narrowly escaped death or injury while watching a rocket demonstration; the missile blew apart on its launcher. That same year he ran a personal test of the Spencer breech-loading rifle, a pet project, and Bruce reports he scored six bull's-eyes in seven shots. (His judgment was vindicated at Gettysburg. Spencer-armed sharpshooters helped turn back the Confederate second-day attack.)

Meanwhile he pressed for better cartridges, ironclads, submarines, mines—weapons newly devised. For Lincoln never lost his inventor's mind—and it was this, historians say, that stood him in good stead as a statesman.

"The special quality of Lincoln's statesmanship," writes historian Allan Nevins, "was its extraordinary realism or practicality... his grasp of what was practical at any given moment."

It was, Lincoln scholars say, the approach of a scientifically-minded small-town inventor who once had run aground on New Salem Dam.

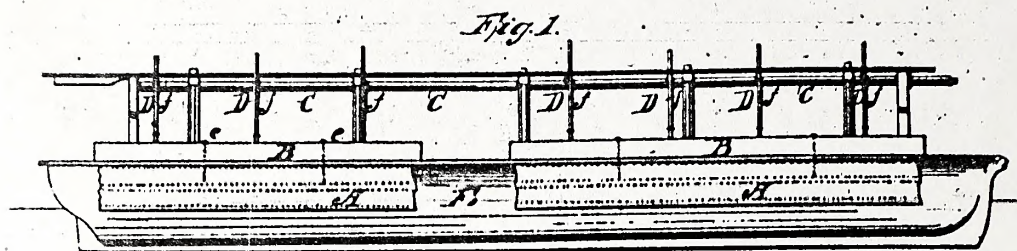
150 Candles for Lincoln

This year, ceremonies everywhere will mark Abraham Lincoln's 150th birthday. Busiest week begins Monday, includes a Washington dinner to be attended by President Eisenhower, former Presidents Truman and Hoover; a joint session of Congress; dinners in many Lincoln-minded communities.

Year's plans also include a series of Lincoln commemorative stamps, a special Lincoln penny, a nationwide essay contest, wreath-layings at Lincoln statues, weekly radio programs, a special TV show.

At Farmington, Ky., the home of Joshua Speed, where Lincoln once mended a broken heart, will be opened to the public April 18. In Washington County, Ky., the 1806 wedding of Lincoln's parents will be re-enacted June-12.

Museums, including the Library of Congress, will hold special Lincoln exhibits. Among those you might wish to visit: Ford Theater Museum, Washington; Lincoln Museum, Fort Wayne, Ind.; Lincoln Home, Springfield, Ill.; Lincoln Room, Gettysburg.



Patent drawing shows work of Lincoln's riverboat invention. Poles worked bellows, pumped hold with air.

A. Lincoln, Inventor

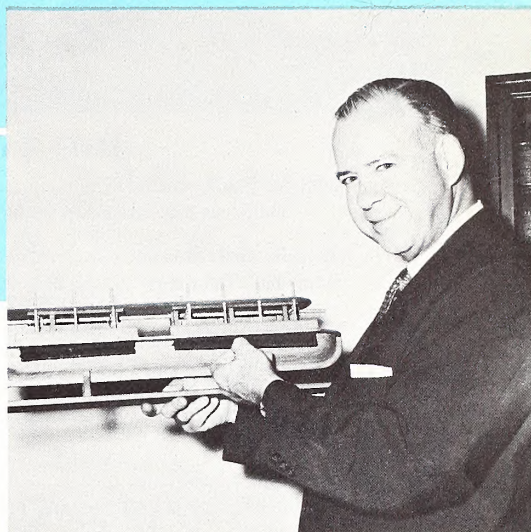
On April 6, 1861, just six days before Fort Sumter was bombarded opening the hostilities in the Civil War, HARPER'S WEEKLY published an editorial commenting on a little known interest of President Lincoln. This is it:

Among the registered patents in the Patent Office at Washington is one for buoyming vessels through shallow waters, taken out some years ago by Abraham Lincoln, of Springfield, Illinois.

The method is by the employment of air-chambers constructed on the principle of a bellows, and distended or contracted by ropes, as the depth of water may require. It was by a somewhat similar scheme, on a larger scale, that it was once proposed to bring the *Great Eastern* through the East River to a dock.

The inventor, Mr. Lincoln, has not had the satisfaction of seeing his patent in use on the Mississippi or its tributaries.

But it has fallen to his lot to be in command of a ship of uncommon burden on a voyage of uncommon danger. It devolves upon him to navigate the ship of state through shallows of unprecedented peril, and over flats of unparalleled extent. The difficulty is how to prevent her grounding and becoming a wreck.



A model of Abraham Lincoln's invention, a river boat equipped with bellows-like fixtures on the sides to help raise the boat in shallow passages, is shown here by Dr. R. Gerald McMurtry, Director of the Lincoln National Life Foundation. This photograph was taken in the Foundation's Museum shortly before Dr. McMurtry left to lecture on Lincoln for three months in the Orient under the sponsorship of the State Department.

We trust that the President will set the fashion of using his own patent.

He must throw some of his cargo overboard, and buoy up his craft on all sides. He need not change his voyage, or sail for a strange port. But unless he can set his air-chambers at work so as to diminish the draught of his vessel—in a word, unless he can increase her buoyance, and bring more of her hull into God's daylight, he will run no small risk of losing her altogether.

Abraham Lincoln And the Detroit River

By THOMAS I. STARR

Reprinted from the Thursday, February 6, 1964, issue

of the

Michigan Christian Advocate

Adrian, Michigan

Something different about the life of Lincoln, besides being a little-known fact, associates him with Michigan and indicates that at one time he traveled the "horseshoe" waterway around the state's Lower Peninsula.

Abraham Lincoln

And the Detroit River

ABRAM LINCOLN was an inventor.

He created a device for easing river boats over shoals and was granted patent No. 6469.

Most biographers of the 16th President mention this, but not one of them has ever intimated that the Detroit River had any part in the matter.

Perhaps the Detroit River did not have anything to do with it; the writer could be drawing erroneous conclusions from a definite pattern of facts. But the facts having to do with the patent issued on May 22, 1849, to Lincoln, seem to this writer to hinge on Lincoln's observation of an incident which took place almost eight months earlier on the shore of Fighting Island in the Detroit River, just below Detroit, the morning of September 29, 1848.

Lincoln is known to have been a riverman of no mean ability. His first dollar was earned with a row-boat on the Ohio. He had piloted flat boats down the Sangamon and the Mississippi around the time he had turned 21. Shallow waters and their hidden obstructions had taught him the dangers of river shoals.

Hadn't he been snagged on the Rutledge mill dam at New Salem, where the little village's population turned out to watch him re-float his New Orleans-bound flat-

By **THOMAS I. STARR**

boat and prevent disaster to his cargo?

This had happened in April, 1831, the first time he saw the Salem community that was later to be his home. Many are the incidents that could be cited to show Lincoln's active interest in river navigation and his efforts for waterway improvements. This interest was to continue later all during his legislative career in Illinois and in the United States Congress.

(Also of interest at this point is a traditional — although unproved — account that on this first New Orleans trip he visited a slave market auction, and is said to have uttered the comment, "If

I'm ever given the chance, I'll hit that thing and hit it hard!")

Some writers believed the idea for his single invention had its inception in the Rutledge mill dam incident; if so, he waited 17 years to develop it and make the model upon which the patent was issued.

During those years he achieved for himself a reputation as a lawyer and politician. He served four terms in the Illinois legislature; twice he had been a presidential elector; and he was at this time the only Whig party member in the Thirtieth Congress of the House of Representatives from the State of Illinois.

Lincoln had defeated Peter Cartwright to win election to Congress. A presidential election between Lewis Cass and Zachary Taylor was approaching, and Lincoln had some Taylor speeches to make in New England. He ended his tour in Boston and started for his home in Springfield.

On the way he was joined by Mrs. Lincoln, and together, they visited Niagara Falls, then went to Buffalo and boarded the S.S. Globe. . . . and here we come to a series of facts not so well known.

Most biographers know that Lincoln left Buffalo on a boat, but its name and destination or where he left it was not known until 1944, when the former Abraham Lincoln Association published

About This Article

Although this article appeared earlier in two historical publications, it is new to Advocate readers; and it seems timely in the month of Abraham Lincoln's birth, and in a period when recent tragic happenings have brought a renewed interest in the life of our first assassinated President.

Acknowledgements are made to the Bulletin of the Detroit Historical Society, wherein this article was first published; to the Telescope, published by the Great Lakes Maritime Institute, and to Robert E. Lee, director of the Dossin Great Lakes Museum.

a small volume of contemporary letters with the title, "Concerning Mr. Lincoln."

This book was made up of selected letters written by Lincoln's contemporaries. The letters were carefully chosen from a large number of manuscripts located in libraries and private collections, each giving contemporary facts on Lincoln.

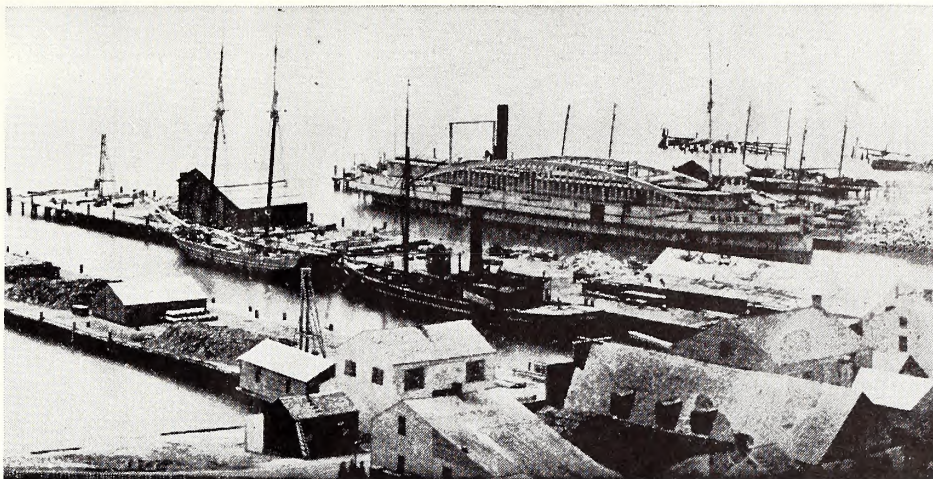
Selection of the letters and the editing of the book was done by the late Dr. Harry E. Pratt, one of the foremost Lincoln authorities of the period. He was then secretary of the Abraham Lincoln Association, and the author and editor of the Association's publications, many of which are recognized for their reference value by present-day students and writers of the life and career of Abraham Lincoln.

Contained therein was a letter written in 1864, to Illinois Senator Lyman Trumbull, asking him to intercede with President Lincoln for a certain political appointment for one Levi North, a Kewanee, Illinois, lawyer.

Wrote North to Senator Trumbull, "Should you see fit to present the matter to the President . . . Mr. Lincoln may remember that in October 1848, he *came around the lakes* on the steamer *Globe*, and that he and I held a debate on two days, on that trip, in which he defended Old Zach and I defended the Free Soil platform."

(Earlier in his letter, North had explained to Trumbull that he had changed his political thinking since 1848, and was now seeking an appointment as a district judge. He was not successful.)

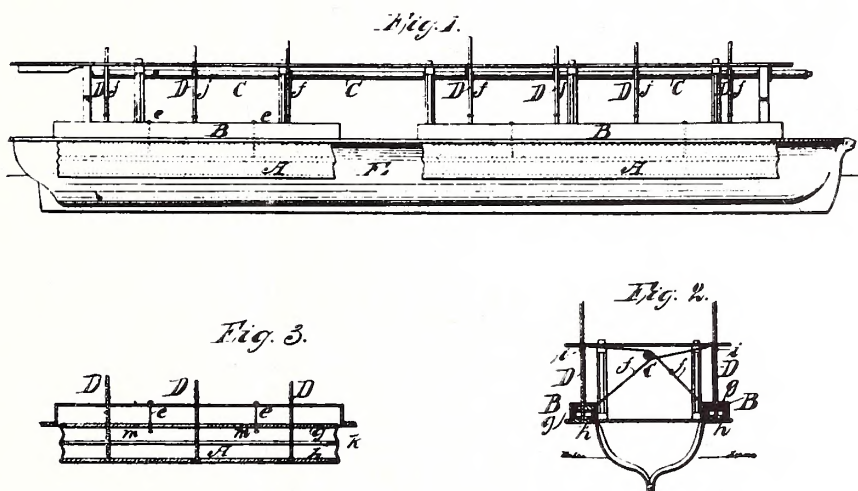
Historians have generally written that Lincoln left the boat at Toledo or Detroit and traveled to Springfield by rail and stage coach. Mr. North said that Lincoln and he "came around the lakes," which seems to square with other known facts. Lincoln left Buffalo September 25; ten days later, on October 5, Mr. and Mrs. Lincoln registered at the Sherman House in Chicago.



This is a picture of the steamer *Globe* taken between 1860 and 1864 at a dock at Northport, Michigan.—Photo print by E. O. Clark, made by kind permission of the Historical Society of Pennsylvania.



On Nov. 8, 1860 the boiler of the *Globe* exploded at Chicago with a loss of fourteen lives. The tragedy is graphically illustrated in this contemporary woodcut. Three years later the ship burned and sank in Saginaw Bay.—Photo, Rev. E. J. Dowling, S.J.



A sketch of Abraham Lincoln's plan for buoying vessels over shoals, filed with his application for a patent, March 10, 1849. The ingenious device consisted of ropes, pulleys and bellows. The bellows, located on either side of the vessel just below the water line, were to be filled with air thus increasing the boat's buoyancy and lifting it over the shoal.

No. 6,480
A. LINCOLN
PATENT OF INVENTION
Filed May 22, 1849.

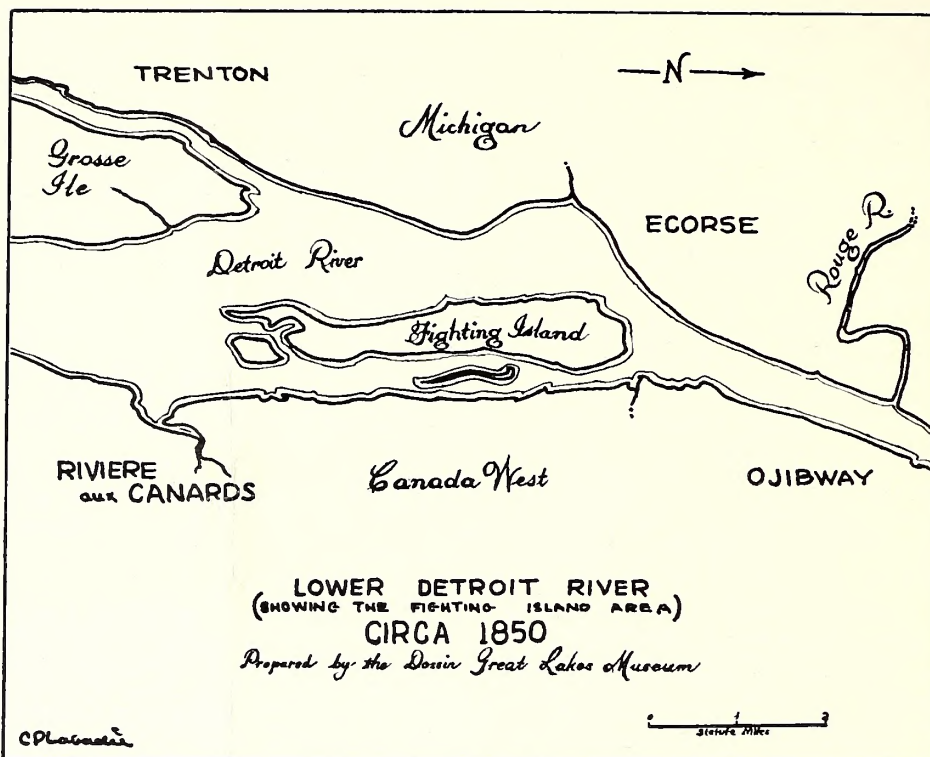
The schedule of the *Globe* on that trip can be traced in the *Detroit Free Press* and other contemporary newspapers. In the *Free Press* of Friday, September 29, 1848, it was found that the *Globe*, "enroute Buffalo to Chicago," had "reported" at Detroit. In the issue of Saturday the 30th, the *Free Press* prints this obscure paragraph, and upon it hangs the nub of this story:

"THE CANADA ASHORE — This noble steamer in going down the river on Thursday night ran ashore on Fighting Island quite hard, and was there yesterday when the *Globe* came up. The night was exceptionally dark. . . ."

But who cares about the darkness of the night of September 28, 1848, except that its happenings throw white light upon another fragment of the Lincoln story? We know that Lincoln was aboard the *Globe* when it passed the stranded Canada, and it seems reasonable to assume that he must have seen the efforts being made to refloat the latter ship.

Let's pick up the thread of the narrative from W. H. Herndon's three-volume "Lincoln." Herndon in telling the story had mistakenly stated that Lincoln had been a passenger on the boat that had gone aground; and then added, "Continual thinking on the subject of lifting vessels over sandbars and other obstructions in the water suggested to him (Lincoln) the idea of creating an apparatus for the purpose. Using the principle involved in the operation he had just witnessed, his plan was to attach a kind of bellows on each side of the hull of the craft just below the water line; and by an odd system of ropes and pulleys whenever the keel grated on the sand these bellows were to be filled with air; and thus buoyed up, the vessel was expected to float clear of the shoal."

Herndon also tells how Lincoln whittled out his model, frequently bringing it into the Lincoln and Herndon law office and there explaining its operation and merits. Frequently Lincoln



The above map of the Detroit River, showing Fighting Island, was drawn especially for use with the article "Abraham Lincoln and the Detroit River" by the Dossin Great Lakes Museum. The map was taken from the period when Lincoln made his historic trip up the Detroit River.

would demonstrate the operation of his model in the horse trough in Springfield's Public Square.

Returning to Washington in December for the second session of the Thirtieth Congress, Lincoln took with him his model. How much time he devoted to it during the remaining few months of the session is not known. Six days after adjournment, on March 10, with his model under his arm, Lincoln walked over to the Patent Office and filed his specifications and application for patent; and patent No. 6469 was issued to him in due time.

The *Globe* was a new steamer on the lakes, and had been in service only a few months before it carried Lincoln. Built in Detroit, it weighed 1,200 tons,

and was converted from side wheel to propeller in 1860, following an explosion of her boilers. In this mishap fourteen lives were lost. Three years later it burned and sank in Saginaw Bay. It was raised and converted into a barge and was finally wrecked in Leamington, Ontario, in 1873. The Canada, too, was a new boat, something of a luxury lake liner of its day, making trips regularly between Detroit and Buffalo.

Despite several unconfirmed stories to the contrary, this writer is strongly of the opinion that Lincoln never saw Detroit, except from the deck of the *Globe*. And just as strong is this writer's belief that the incident on Detroit River's Fighting Island made Lincoln an inventor.

While Honest Abe Was In Congress

Lincoln Whittled Patent Model Now Gathering Dust In Exhibit

But His \$30 Fee Was Wasted
As Boat Invention Languished

By SOPHIA P. GERBER

North American Alliance

NEW YORK, Feb. 12—In an obscure showcase in the Model Hall of the United States Patent Office stands one of the most priceless inventions ever accepted by this registry of the rare and unique.

Yet, it never revolutionized an industry, nor did it affect our lives with anything near the impact of, say, the can opener.

For all that, this rough, foot-and-a-half long model of a steamboat, looking as if it had been whittled out of a cigar box and wood plank, is worth a king's ransom. The inscription reads: "Improvement in method of lifting vessels over shoals," and the inventor is Abraham Lincoln.

In 1849, the 40-year-old Illinois lawyer was in the throes of a political tug of war. His term of office in the House of Representatives had almost come to an end and he was trying to secure, either for himself or for someone else from Illinois, the job of commissioner in the General Land Office in Washington.

Although this job was "about the only crumb of patronage which Illinois expects," wrote Lincoln, several politicians were after the same position. It looked as if even this modest request would not be granted him, Lincoln's personal political power never seemed at lower ebb.

In the middle of these political anxieties, Lincoln suddenly decided to work on an invention. He probably needed something to take his mind off his problems.

Once, after a session of Congress, Lincoln had traveled home to Illinois via Niagara Falls. At one spot, his vessel got stuck on a sand bar. It appeared that the voyage might be seriously delayed.

The captain immediately ordered all hands to collect loose planks, empty barrels and boxes. Working rapidly, the crew forced these improvised "jacks" under the sides of the boat. The empty casks helped to buoy up the boat until she swung clear of the bar and was able to continue on her way.

Standing on deck, Lincoln watched these frantic activities with a thoughtful eye. They undoubtedly brought to mind some vivid memories of his own past. Perhaps he remembered the many times he had performed the same energetic service for boats at New Salem dam.

Lincoln, himself, was a boatman with many years of experience up and down the Mississippi River. A friend of Lincoln's recalled that the first time he had seen the man who was to become our most revered President, the six-foot-four youth was "in the Sangamon River, with his trousers rolled up five feet, more or less, trying to pilot a flat-boat over a mill-dam."

The shoals and snags of western waters were not only inconvenient to travelers, they were downright dangerous.

Lincoln returned from his Niagara Falls trip with an idea. He borrowed some tools from Walter Davis, a mechan-

ic who had a shop next door to his law office. Like any first-time inventor who thinks he has caught the world by the tail with a better mousetrap, Lincoln was ardently devoted to his brainchild.

Frequently, he would bring his ship model to the office and whittle away, while keeping up a running prattle on its merits. To William H. Herndon, his law partner at the time, he told Herndon that his "improvement" would revolutionize steamboat navigation.

Sometimes Davis would stop in and toss out a bit of professional advice. Occasionally, he lent a hand in developing the miniature.

Herndon watched all of this skeptically. Later on he commented that he always "re-

garded the thing as impracticable." But he said nothing, probably "out of respect for Lincoln's well-known reputation as a boatman."

If Lincoln was aware of Herndon's lack of enthusiasm, it certainly didn't dampen his own. By March 10, he had developed his idea sufficiently so that he could apply to Commissioner of Patents Edmund Burke for a patent on an "Improved Method of Lifting Vessels Over Shoals."

Lincoln dutifully complied with the provisions of the patent law. He swore under oath that he was a citizen of the United States, that he believed himself to be the original and first inventor of this particular idea.

When he showed the boat model to one patent authority, he toned down his fer-

vor and modestly said that he "reckoned" the vessel and accompanying gadget would work "where the ground was a little damp."

Basically, the gadget he designed to ease steamboats over obstacles was this. The apparatus looked like a bellows or expandable buoy. To be effective, Lincoln's "snag-remover" had to be used in pairs—one on each side of the hull, just below the water line. A simple system of valves and pulleys operated the bellows.

When the vessel's keel grated against sand or some other kind of obstruction, the bellows were supposed to fill with air. This in turn would buoy up the ship to a level where she could float over the hindrance and continue on her voyage.

While the system of ropes and pulleys was somewhat unusual, there was nothing Rube Goldbergesque about Lincoln's invention. No elaborations or ornaments decorate the finished model. The boat is carved, strongly, but simply, just as you might imagine a retired railsplitter would whittle.

After designating one Z. C. Robbins as his agent and attorney and paying \$30 into the United States Treasury for the exclusive right to make and use, and sell to others the right to make or use his invention, Lincoln was ready to go into business.

On April 13, Robbins wrote

the inventor from Washington, informing him "with pleasure," that he had obtained a "favorable decision on your application." On May 22, 1849, Patent Number 6469 was duly issued and Abraham Lincoln officially joined the ranks of America's distinguished inventors.

The \$30 Lincoln paid into the national till for this privilege was probably the worst investment he ever made. There is no record that his invention was ever applied to any vessel, floating or nonfloating, in the western or any other hemisphere. Certainly, the threatened revolution in steamboat architecture and navigation never came to pass.

Yet, in a way, it is not surprising that Lincoln, at some point in his varied career, would try his hand at invention. He had always felt very strongly that man should learn to use his powers of "observation, reflection and experiment" to better the world.

Lincoln's steamboat, with bellows attached, foundered on the shoals of indifference. But the inventor eventually went on to guiding the Ship of State over more perilous shoals and dangerous obstructions than he ever dreamed could exist in his early river days. And this time, his creative powers were recognized.



Model whittled by Abraham Lincoln stands in dust in Patent Office.

CONTINUED

18—THE WASHINGTON DAILY NEWS, FRIDAY, FEBRUARY 12, 1965
REFLECTIONS ON A BIRTHDAY

By MILTON BERLINER

Speakers have fanned out over the nation to pay tribute to Abraham Lincoln today on the 155th anniversary of his birth.

They are talking about Lincoln the Prairie Lawyer, Lincoln the Humorist, Lincoln the President and Lincoln the Emancipator. But chances are none of them will mention Lincoln the Inventor.

BUT ONE

None, that is, except Judge Arthur M. Smith of the U.S. Court of Customs and Patent Appeals who speaks at the New York Avenue Presbyterian Church tonight.

Judge Smith, who came to the bench here in 1959 after 30 years as a patent lawyer in Dearborn, Mich., has done considerable research into Lincoln's life-time interest in things mechanical.

To Judge Smith, Lincoln's inventiveness (on May 22, 1849, he was granted a patent for a device to buoy riverboats over sand bars and shoals), is not just an interesting sidelight on a great man.

He sees it as a basic motivation that may well have been vital in determining the outcome of the Civil War.

WEAPON

For example, Judge Smith said, Lincoln personally selected the breech-loading rifle as a new weapon for the army.

"Some students say this was the critical point in the war," said Judge Smith. "It could easily be true. Pickett's charge at Gettysburg was repulsed by these (rapid fire) five-shot rifles. And it is doubtful if Ericson would have gotten very far with the Monitor if he hadn't sold Lincoln the idea."

But more important to Judge Smith is the fact the Lincoln viewed inventions not merely as a means of improving the physical lot of man but as a way of freeing the mind as well.

In a lecture on discoveries and inventions which Lincoln delivered on Feb. 11, 1859, to the Phi Alpha Society of Illinois College, Lincoln said that young America's "horror is for all that is old; and if there be anything old which he can endure it is only old whisky and old tobacco . . . the great difference between Young America and Old Foggy is the result of discoveries, inventions and improvements. These, in turn, are the result of observation, reflection and experiment."

Only thru the invention of printing, he said, did it become possible "to get a habit of FREEDOM OF THOUGHT established."

And, he said, a new country, like America, is most favorable —almost necessary — to the immancipation (sic) of thought, and the consequent advancement of civilization and the arts."

Even the Presidency did not curb Lincoln's concern with inventions, Judge Smith said.

He insisted on reading all the mail about them, and, Judge Smith said, his door was always open to any inventor who came to call.

Abraham Lincoln, Inventor

I

The year was 1831, and it was spring. The brown prairies of Illinois were being rapidly freed from their heavy coverlet of snow. Each little rivulet was adding its own snow water to some larger stream and each stream its collection into the neighboring bank of the Sangamon, sweeping and of husky young frontiersmen months they had looked for, for it meant the beginning

trader and promoter had engaged to take a boat load of produce down from the attractiveness of fifty mus of \$60, was the opportunity of their home outside world. Offutt, a dealer, had agreed to have shipped and fitted for the boat's offerings, when the time to embark, there was disappointment no more. Disappointment no more, all the anticipated fireplaces in the log cabin had gone to smash. The boat did an angry but young men plod their way

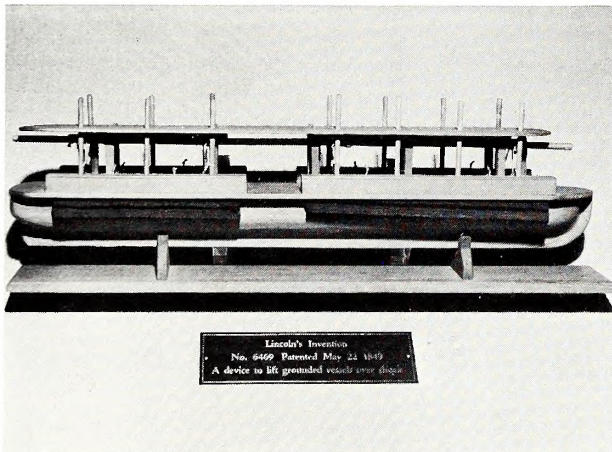
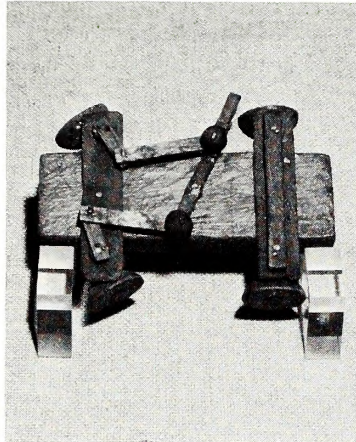


ABRAHAM LINCOLN,
INVENTOR



Lincoln The Inventor

This replica of a wagon was whittled by Abraham Lincoln about 1850. The front wheels move but the axle remains stationary. The same principle is utilized in today's automobiles.



This is the scale model of a river boat on which Lincoln obtained letters of patent on May 22, 1849. The invention was an improvement for lifting vessels over shoals and consisted of a bellows on either side of the hull just below the water line. The air chambers were intended to buoy up the vessel when in danger of grounding on a reef or other obstruction. The principle is now applied to raising of sunken submarines and other craft. Both items are on display in the Lincoln Museum.

■ It was about this same time of the year in 1831, that Abraham Lincoln and a group of husky, young frontiersmen stood on the banks of the Sangamon River. The flood swollen waters were perfect for their adventure. If the water remained high, they wouldn't have any difficulty floating their makeshift boat, laden with goods, to New Orleans.

This would be the first opportunity for most of the crew to leave the restricted confines of their home country and see the great outside world. The pay for the cruise would be an attractive 50 cents a day and a bonus of \$60 upon reaching New Orleans with their cargo.

The boat was finally launched after a series of hardships. Spectators along the winding banks of the Sangamon were in for a surprise. The boat continued downstream and it was only after reaching a grist mill that the ambitious crew encountered trouble. Suddenly, without warning, the boat was lodged on the mill dam.

The following is a description of how a tall, gaunt, young man known as "Abe" Lincoln took charge.

"The heavy barrels in the boat were all rolled to the bow that projected beyond the dam and above the water. The front end thus weighted swung downwardly, and the rear end thereby lightened, rose safely above the flood that raced around it, while all the water shipped into the boat over the stern promptly followed the barrels into the bow." Then, 'Abe', according to the story, bored a hole through the bottom of the bow. The water soon drained, and after plugging the hole, it was an easy task to slide the boat on over the dam.

This experience and other problems of safely navigating the rivers of our country undoubtedly impressed Mr. Lincoln and were responsible for his invention of a device to lift boats over shoals and snags.



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Lincoln Lore

November, 1976

Bulletin of The Lincoln National Life Foundation...Mark E. Neely, Jr., Editor. Published each month
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Number 1665

“... one of the little breech-loading cannons I got of Hon. Eli Thayer.”

Editor's Note: Important credits for this issue go to Dr. Jack P. Covell, researcher, restorer, and owner of the piece under discussion, to Gary L. Delscamp, researcher and photographer, to Russell E. Thornton, who discovered the patent mark, and to Donald E. Thornton, who helped his father.

M. E. N., Jr.

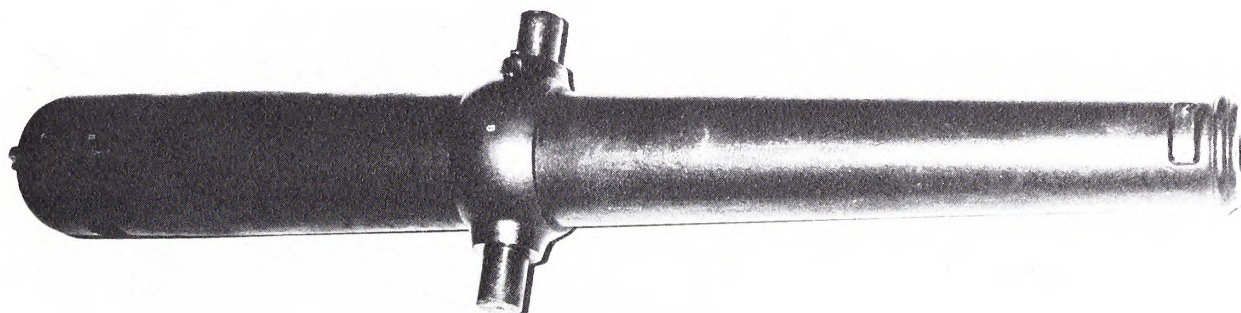
About a year before he won election to the Presidency, Abraham Lincoln asserted that the three discoveries and inventions of greatest value to the human race were “the arts of writing and of printing — the discovery of America, and the introduction of Patent-laws.” These were of crucial importance, he said, because they served to facilitate all other discoveries and inventions since. Probably only a few patent lawyers would still rate the introduction of patent laws on a par with the discovery of America and the development of writing and printing, but this serves well to reveal a peculiar trait in Abraham Lincoln's character: he was fascinated by technological innovations.

Lincoln's weakness for inventions would have large effects when he became President of the United States. The Army was of the mind that no invention could be developed fast enough to have any profound effect on the war at hand; therefore, it turned a deaf ear to the horde of inventors who descended on Washington with their various, curious, and sometimes efficiently lethal wares. These innovative Yankees quickly learned that their chances for a real hearing by the War Department were much enhanced if they could only get to Lincoln, persuade him of the merit of their schemes, and then be sent to the War Department with a request from the Presi-

dent that they be given a fair hearing. So much of this activity went on, in fact, that Robert V. Bruce managed to write one of the more ingenious (and lively) books in the whole field of Lincolniana, *Lincoln and the Tools of War*, in which he related the stories of dozens of inventions and their encounters with President Lincoln and the War Department.

Among those inventions the acceptance of which spoke well for Lincoln's ability to forecast the technological future, was a curiously elusive piece of artillery called, for no very good reason, “The Ellsworth Gun.” Muzzle-loaders and smooth-bores were very quickly a thing of the past after the American Civil War, and this little cannon was, therefore, a milestone in the history of American artillery: it was the only American breech-loading rifled cannon purchased by the War Department during the Civil War.

Unfortunately, the Ellsworth Gun was not as epoch-making in American military history as it was in the history of American technology. Fewer than fifty of the cannons were produced, and despite their association with some of the war's more colorful commanders, Elmer Ellsworth, Benjamin F. Butler, and John C. Frémont, they proved to be rather ill-starred in combat. A number were captured by the Confederates in the Shenandoah Valley campaign of 1862 against General Frémont, and others found their way to out-of-the-way and inglorious theaters of combat. As Professor Bruce puts it, “By 1863 all the Ellsworth guns had vanished into limbo or Dixie.” Until recently, none has been seen, but a candidate for being one of the long-lost little cannons has come to the attention of *Lincoln Lore*, and we are happy to have the exclusive right of reporting this find.



Courtesy G. L. Delscamp

FIGURE 1. This is a photograph of the recently discovered barrel of a small cannon. Taken just two months ago, it shows a small square hole near the breech in the lower left-hand corner of the picture. Two metal wedges and a tray to hold them have been removed to expose the holes. FIGURES 2 and 3 on page 2 show the breech before the wedges and other attachments were removed. Note the number “5” which appears on the trunnion, the metal sleeve around the middle of the barrel from which the cylindrical rods which rested on the carriage protrude.



FIGURE 2. This photograph shows the right side of the breech. The two metal wedges rest one atop the other in the tray. The lower wedge had a handle which protruded parallel to the axis of the barrel. By pushing it away from the barrel, it caused the wedges to work against each other, loosen the interior breech mechanism, and finally slide out into the tray. The rings probably had chains on them which kept the wedges from being lost from the barrel.

Courtesy G. L. Delscamp

All modern accounts of the Ellsworth gun, for which no patent models, drawings, or plans have ever been found, are based on Bruce's pioneering study, and here is the substance of that account:

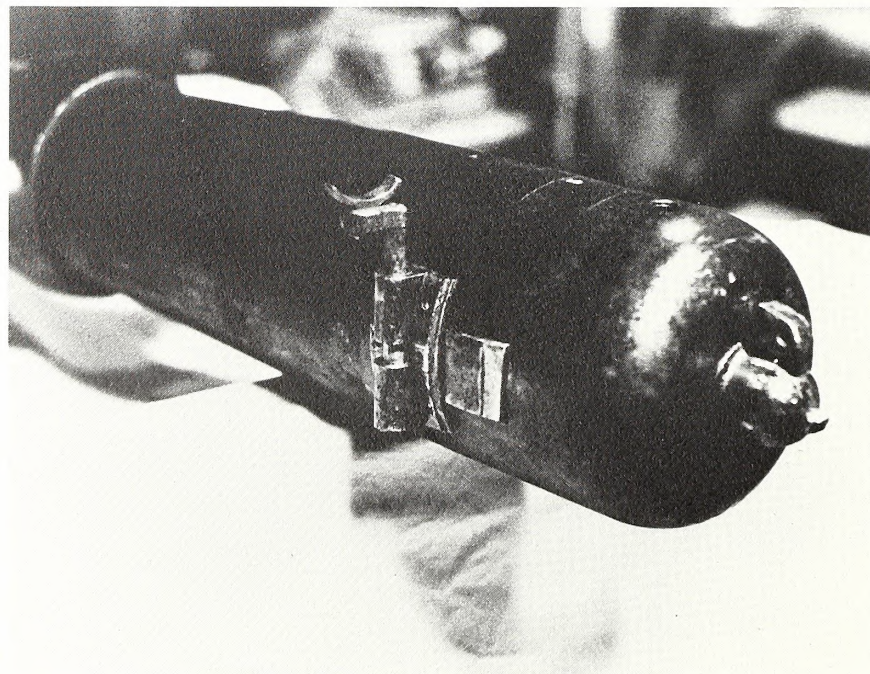
Having bought manufacturing rights to B. F. Joslyn's new breech-loading rifle, the imaginative Yankee [Eli Thayer] applied the same design to a little breech-loading fieldpiece and sent a dozen specimens out to chastise the Kansas "border ruffians." In April 1861, when the conflict flared up again on a continental scale, Thayer sold two of his little cannons to the Union Defense Committee of New York, for the use of Elmer Ellsworth's Zouave regiment. Thereafter he called his cannon the "Ellsworth Gun."

This curious hybrid, somewhere between a Brobdingnagian rifle and a Lilliputian cannon, fell under Lincoln's interested scrutiny in September 1861. The gun Lincoln saw

was four feet long, had a 1 1/2-inch bore and weighed about three hundred pounds without its carriage. Like the Joslyn rifle, its breech mechanism consisted of a cone and expanding rings, held in place by a tapered steel key which passed through the shank of the breech and was operated by a compound lever. A handle opened the breech piece. The conical chilled-iron ball, wound with tallow-soaked cord, fitted into a cup at the end of a brass cartridge; and the 3-ounce charge was ignited through perforations near the other end. Instead of a limber, the carriage had a drag rope attached for hauling by manpower.

Thayer made much of the gun's maneuverability, cheapness and rapidity of fire; and Lincoln at last consented to order twenty guns at \$350 each, subject to the inspection of McClellan's chief ordnance officer From 1863, when the cannons disappear from the official re-

FIGURE 3. This is the left side of the breech. The two wedges protrude slightly above the surface of the barrel, just behind the device which must have cradled a sight of some sort. The bore of the rifled cannon was so small that it fired a very small projectile which could not have been very destructive and had, therefore, to be accurately placed. The hole above the breech is a mystery, but it may have held a level. Since the rifle had a range of three miles, it doubtless had to have a telescopic sight on it.



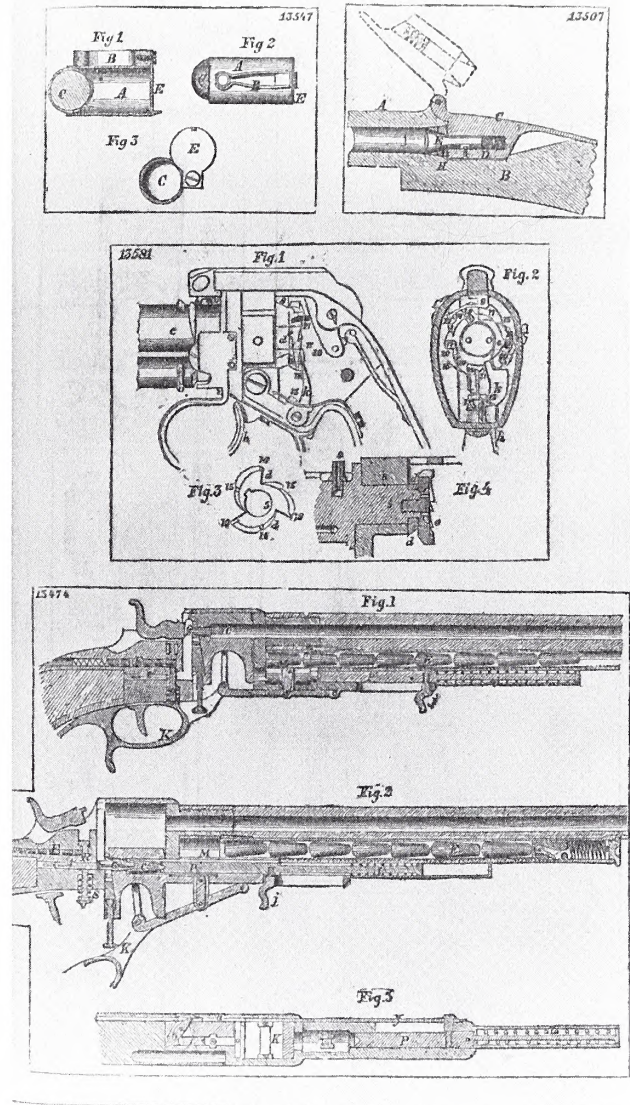
Courtesy G. L. Delscamp

cords, until June, 1974, when a cannon barrel was purchased by two gun collectors from a man who had acquired it to decorate his rock garden, there has been no evidence of the Ellsworth cannon. The barrel in question did not provoke much interest at first. The two gun collectors made a five-minute examination, decided that the little piece must have been the sort used to throw lines of rope from distressed ships to shore or *vice versa*, and within half an hour sold the barrel to a local firearms dealer as a curiosity or advertising piece for his store. The dealer had the barrel for six days. He removed some of the coat of thick black paint which covered the barrel and found a patent mark. Having been in the gun business for thirty years, the dealer had acquired some standard references on the history of weapons. Checking *The Breech-Loader in the Service*, he found the patent date listed there and realized that he had probably acquired a breech-loading Civil War piece rather than a line-throwing gun. He had no reason to believe that these were not produced by the thousands and happily sold the gun for about 700% profit to two men who frequented his shop.

These two men, Dr. Jack Covell and G. L. Delscamp, were better equipped to evaluate the significance of the little field-piece. Dr. Covell is a gun collector with a solid technical knowledge of the practical workings of firearms, though twentieth-century weapons are his specialty. Mr. Delscamp is a recent college graduate with a degree in history and an ability to find his way around a library. Between them, they decided that the cannon barrel was no ordinary piece from the standard arsenal of Civil War weapons but the rare Ellsworth cannon, and they went to work to clean up the gun and prove their point. This work has taken two years of incredible efforts in garages and machine shops. Along the way, Mr. Delscamp lost interest and sold his share to Dr. Covell, who has continued the machine-shop work and the thankless process of writing and telephoning experts in the history of weaponry. Of course, there can be no real expert on a gun no one has ever seen so much as a picture of, and these efforts have not been altogether successful. Moreover, the desire to keep the barrel in good shape for posterity and the limited means available to an ordinary citizen who does not own a foundry have prevented exerting the kinds of force and violence on the piece that might open it up and prove the way its mechanism works. Nevertheless, the evidence for Dr. Covell's little cannon is substantial.

The dimensions seem to fit the existing word descriptions of the Ellsworth Gun. The barrel weighs around 290 pounds, is four feet long, and has a 1 1/2-inch bore. It is no line-throwing gun because the barrel is rifled, and the spin imparted by rifling would only serve to snarl a rope flying through the air. Although the breech plug is apparently firmly shut with rust and corrosion and the breech has not yet been opened, the cannon must be a breech-loader. Otherwise, there is no reason for the presence of the curious-looking compound wedges which protrude from the side of the piece and penetrate through the other side. These wedges operated by a handle which, though broken off and stuffed in the muzzle (along with a lot of rocks, debris, and what looked like red Georgia clay), extended parallel to the axis of the barrel from the circular protrusion on the breech-side of the upper wedge. Strenuous efforts have caused these wedges to move and, in fact, be removed from the cannon. But they did not do what doubtless they were meant to do before the breech plug rusted, force the breech plug out so that the barrel could be loaded from the rear.

All of these pieces of evidence might add up only to the fact that the barrel is that of a small old rifled cannon with a curious system of wedges near the breech. The important piece of evidence, however, is that patent date which first made the gun dealer realize he had something more than a seacoast curiosity. Stamped on the breech near the protruding plug is:



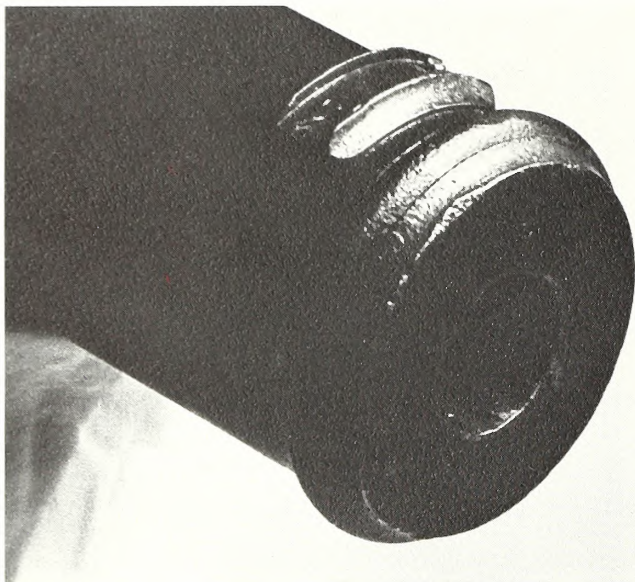
From the Lincoln National Life Foundation

FIGURE 4. This page from the plates of the *Report of the Commissioner of Patents for the Year 1855* contains the diagram of the B. F. Joslyn patent in the upper right-hand corner.

PATENTED
AUG. 28TH, 1855

A check of the *Report of the Commissioner of Patents for the Year 1855* reveals that only one patent was issued on that date for a firearms device. It was patent number 13,507, issued to B. F. Joslyn for an "Improvement in Breech-loading Firearms." It was the Joslyn patent which Eli Thayer purchased and adapted for use in a small rifled cannon.

In a letter to President Lincoln written on September 21, 1861, Thayer advised the organization of companies of soldiers armed with twenty of these weapons, which, he claimed, combined the advantages of artillery and infantry rifles. So light in weight (he claimed they weighed in at something like 200 or 225 pounds — quite an underestimate) that they could be pulled into place by men rather than horses and so small that they could be placed anywhere a rifleman could, the Ellsworth Guns nevertheless fired a seventeen-ounce ball a distance of three miles (at three degrees elevation), that is, artillery and not infantry range. Moreover, only a small number of men was required to operate the guns (he did not say precisely how small a number), and they could easily get off twenty rounds per minute. Thayer gave as his address Wil-



Courtesy G. L. Delscamp

FIGURE 5. This close-up photograph of the muzzle shows the rifling (visible at the edge of the shadows at the lower right of the bore).

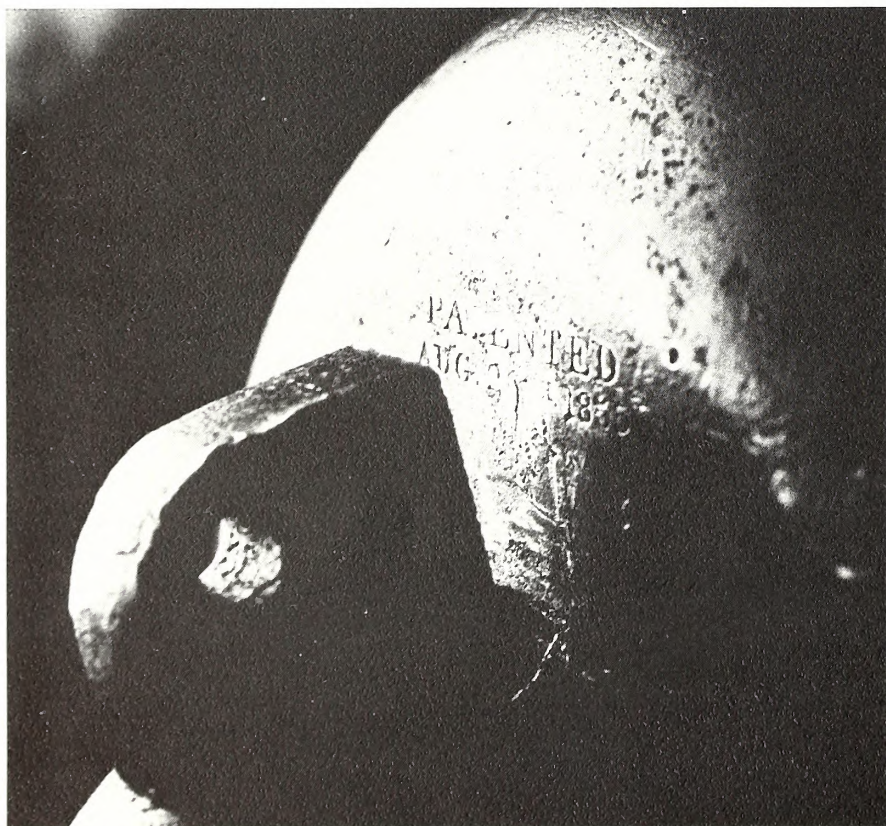
lard's Hotel in Washington, and he had doubtless come down from Massachusetts to lobby for the purchase of the Ellsworth cannon — at what he claimed was a very low price, especially when compared to ordinary field artillery.

Thayer, an ex-Congressman and a maverick Republican who had voted for Lincoln's nomination at the Wigwam, had some influence. Three days later Lincoln drew up a memorandum for purchase of "twenty guns, . . . made equal, or superior to the Ellsworth gun" at \$350 each. Lincoln noted that the gun had recently been exhibited to him. The twenty cannons were

manufactured in Thayer's home town, Worcester, Massachusetts, by L. W. Pond at the factory of Goddard, Rice & Company. Some improvements were made on the model Lincoln had seen, because Charles Kingsbury, who examined the guns in November for the Army, reported that the "cannon rifles" were superior to what he had seen before with Lincoln. The improvements were wide-ranging enough for L. W. Pond to claim that the cannon was his own invention, or so, at least, *The Scientific American* reported in December.

The barrel under discussion here has no other identifying marks than those already mentioned — except the numeral "5" which appears in five different places on the barrel. This numeral, if a serial number, is consistent with the small number of cannons known to have been produced. While in itself it provides no conclusive evidence, it at least does not have to be explained away, as a higher number, in the hundreds, say, would have to be. The device on the side of the breech opposite the wedges is not mentioned in any of the literature on the Ellsworth Gun, but it might be a part of a sighting device, perhaps added as an improvement by L. W. Pond.

The positive proof of the identity of the barrel still lies immobile in the breech. Only the system of rings, pin, and cone will provide sure identification for the Ellsworth Gun, for it is distinguished by its B. F. Joslyn-patented breech device. From all other outward appearances, however, this could well be the long-lost Ellsworth cannon. If it is, it is a significant artifact for Lincoln students (as well as military historians and students of the history of American technology). Abraham Lincoln seems to have been very keen on the little cannon's possibilities, and when a Mr. Hegon visited him later, the President instructed Colonel George D. Ramsay to "show him one of the little breech-loading cannons I got of Hon. Eli Thayer." It was quite an innovative piece of weaponry, and President Lincoln had personally seen to its acceptance by the Army, even to the point of drawing up the terms of the contract and, on December 3, 1861, signing the manufacturer's bill for \$8811.87, "I advise that the above account be paid. A. Lincoln."



Courtesy G. L. Delscamp

FIGURE 6. The all-important patent mark appears, alas, in an awkward place. It is just above the breech plug. Early owners of the barrel apparently damaged the mark in trying to remove the plug. The "T" is partly obliterated, as is most of the "8"; however, the beginnings of both of the loops in the "8" are visible on the side near the "2".

Lincoln Was an Inventor

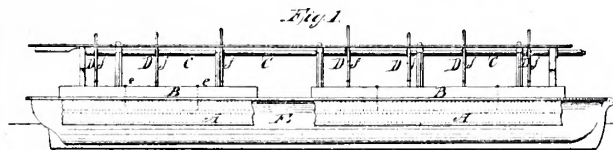
RARE is the man who does not like to tinker with gadgets. The streak of mechanical inventiveness and interest in new contrivances was present in Abraham Lincoln to a degree little known except to a few biographers and generally overlooked in the acclaim of his works as a statesman. In fact, there is ground to believe, as will be developed later, that his renown as a statesman might have suffered had it not been for this mental quality.

Best known of the backwoods President's mechanical interests is a patent issued to him on May 22, 1849, for a de-

vice for buoying boats over the shoals which then constituted the bane of river navigation.

but before that time Lincoln became greatly absorbed in it so that he took over from Herndon the suit between Edmonds and an intended financial backer, and spent much time operating a model of the device and extolling it to persons who came into the office.

A few years later, however, his mechanical interests stood him in better stead when he collected a fee of \$2000, probably the second largest in his career, for preparing an argument in the McCormick reaper case at Cincinnati — a speech which, to his disappointment, remained undelivered, as



A. LINCOLN
MANNER OF BUOYING VESSELS.
No. 6,469. Patented May 22, 1849.

vice for buoying boats over the shoals which then constituted the bane of river navigation.

His interest in this sort of problem dated back to 1831, when as a raw, rugged youth of 22, he and two kinsmen built a flatboat on the Sangamon River near Springfield for Denton Offut and navigated it to New Orleans. This was already his third trip down the Mississippi, and he had helped run a ferryboat on the Ohio before leaving Indiana.

At New Salem a few miles down the river, where Offut was later to set him up as a storekeeper, the boat lodged on a crude milldam, the bow hanging over the low fall and the loaded stern shipping water on the upper side of the obstruction. Some of the cargo was taken off on another boat and then young Lincoln called for a large auger. With it he bored a hole through the plank bottom in the forward end of the boat and let the water run out. He then plugged the hole and the men easily scooted the boat over the rocks and went on.

Seventeen years later when Lincoln was returning from a term in Congress and a visit to Niagara Falls the vessel on which he made part of the trip got stranded on a sand bar. He watched the boat hands at the captain's directions push planks, boxes and empty barrels under the side of the vessel, the casks serving to buoy it up till it floated free.

Returning home he set to work on a model of a device he had figured out along these lines and which he believed would revolutionize steamboating on the western rivers.

It consisted of a series of expansible buoyant chambers, like bellows, ranging along the side of the vessel and fastened to vertical shafts by which they could be forced down into the water, in that way supporting it and raising the keel to a shallower draft.

He expounded the idea to his law partner, Herndon, and would leave the office to work on it in the shop of a mechanic, Walter Davis, who loaned him tools and helped him. Clients would occasionally have to go there to consult him, and at other times he would bring the small model into the office to whittle on it and talk about it with enthusiasm. The patent was granted and a copy of it can be obtained for the usual ten cents at the Patent Office, while the carefully carved model reposes in a case in the Smithsonian Institution, but the device never lifted any steamboats over shoals or brought any royalties to its inventor.

In 1853 there came what might be called the episode of the "horological cradle." This was a contraption of an Alexander Edmonds and is described as a cradle with a kind of clockwork "which, being wound up, would rock itself" like a pendulum by means of weights and pulleys, "thus saving the continual labor to mother or nurse." The "invention" was eventually held to be as unprotected as it was lacking in practical value,

Edwin M. Stanton, later his Secretary of War, bore the brunt of the case. Soon thereafter he figured more prominently in the defense of the Rock Island Railroad Company against a suit by owners of a steamboat that had struck and burned on one of the piers of its new bridge across the Mississippi. In this his close study of river currents and mathematical calculation enabled him to show that the pilot should have been able easily to avoid the obstruction.

In fact, soon after embarking as a lawyer, Lincoln had applied himself to the mastery of Euclid's geometry, and according to Beveridge carried it or an algebra or an astronomy book with him in his long rides of the Illinois court circuits instead of law books.

When in the White House and responsible as leader of the armed forces of the Union, Lincoln took an interest in a number of military inventions, such as the Spencer repeating rifle, or a new kind of powder, and received one of the first telegraph messages from a captive balloon.

Most important of all, he gave steadfast encouragement to John Ericsson, already inventor of the screw propeller, when the Norseman was building amid

much derisive criticism that "Yankee cheese box on a raft," the Monitor, and he kept in close touch with the progress of construction.

So when that vessel with its revolving turret appeared at Hampton Roads in the nick of time and stood off the improvised Confederate ironclad Merrimack or Virginia, its existence was

partly due to Lincoln's interest. Panic spread through the North as the southern ram sank ship after ship of the Union's wooden fleet. Stanton feared a bombardment of Washington; New York harbor lay in dread of an attack; the blockade of the South would be broken and Great Britain would recognize the Confederacy, it appeared. All this was at stake.

How conversant the President was with mechanical details of the ship is indicated in a note to the Secretary of the Navy the day after the fight, a note that helps explain why the Monitor was content merely to bottle up the Virginia instead of seeking a finish fight. He wrote:

Hon. Secretary of Navy,

My dear Sir:

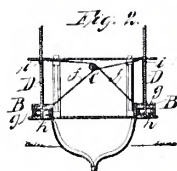
I have just seen Lieutenant Worden, who says that the Monitor could be boarded and captured very easily—first after boarding by wedging the turret, so that it would not turn, and then by pouring water in her and drowning her machinery.—He is decidedly of the opinion she should not go skylarking up to Norfolk.

Yours truly,

A. LINCOLN

The Commander-in-Chief was still the man who had piloted river flatboats and pieced together an inventor's model in Walter Davis's shop at Springfield.

TULLY NETTLETON



UNCLE SAM'S KEEPSAKES

Treasures Laid Away Because of Their Associations.

NOT OF INTRINSIC VALUE

President Lincoln's Device Which He
Tried to Have Patented—Govern-
mental Treaties of Ancient Date.
Rare Volumes in Congressional
Library—Personal Journals.

The government treasure houses have from time to time received on deposit a great many articles deserving in the highest sense of safe-keeping, but many of which are intrinsically worth much less than the space they occupy.

Although of no value for service, and commanding no equivalent in the commercial world, they are as prized as the most sacred of heirlooms, and to purchase any one of them would require a sum equal the proverbial king's ransom. Even at that figure one has to contemplate his Uncle Sam as financially "in the soup," and without a market for a single bond, before entertaining a thought of even the most remote possibility of the exchange of his reens for pelf.

The mementoes of a by-gone age are treasured on account of their associations, and their historical or scientific status—little things, many of them, uninteresting in appearance and liable to be passed by without thought or comment from a casual sightseer.

They are presented in almost every form and guise and are found in all the departments.

The museums have hundreds, the Patent Office a great collection, the Congressional Library its quota, and they take the shape of mechanical devices, gems of thought, specimens of anatomical peculiarity and a thousand other designs.

The mariner's compass of ancient pattern, and dating its origin back to 1604, is a valued government keepsake. It is a memorial story in its way, having been presented to the government by Henry A. Wise, of Virginia, who was at the time minister to Brazil, in the name of Lieut. Shepherd of the United States Navy.

Wherever it may now be found, it contains a ticket with certain information upon it in the handwriting of Governor Wise.

PRESIDENT LINCOLN'S DEVICE.

The framework of a western steamboat was once received as a model at the Patent Office. It bore the date of May 20, 1849, and was designed to illustrate a method of passing boats over sandbars. If successful, the device would have made its inventor very wealthy, but it went the way of thousands of other patterns.

For twelve years it was a conspicuous model, nothing more, but an event transpired at the end of that period that made that model famous. Abraham Lincoln, its designer, was installed as President of the Republic, and at his request, after his inauguration, a messenger hunted it up and took it to the White House, but it was later placed in what was known as the "Washington Case" at the Patent Office.

The model bore a ticket upon which was written: "Model for sinking and raising boats by bellows below. A. Lincoln." The date was added.

The original treaties between this country and foreign powers, for so many years in the custody of the Commissioner of Patents, are specimens of nothing, perhaps, save very indifferent chirography.

With the exception of those with England and the Eastern nations, all are in the French language, and bear a number of huge red and green seals. Among them are the treaty with Austria, with the signature of Francis I attached; the first treaty with Russia, signed by Alexander I; the treaty of peace with England in 1814, to which George IV affixed his signature; an earlier treaty with France, dated in 1803 and signed "Bonaparte," and the agreement arranged with Sweden when Bernadotte reigned in that country.

AMONG THE CURIOSITIES.

A curious document is the treaty with Turkey, consisting of a number of slips of parchment filled with columns of Turkish characters, and yet most noteworthy of all, probably, is the treaty of 1778, made with France, and signed by Louis XVI.

Under that document the struggling colonies were assured of help in their hour of need.

Bibliophiles find in the Library of Congress much that they deem to be precious; the profane call it trash. Medical enthusiasts handle with every sense of delight a rare bone formation that the uninitiated would exchange for a "brass farden," and again the sentimentalists revel in ecstatic bliss among souvenirs left of departed heroes, not one of which would attract the heavy man of business.

There are in the library considerably over 1,000 volumes of American newspapers, including 245 printed prior to the year 1800, a large collection of the journals and laws of the colonial assemblies, showing the legislative policy which culminated in their independence; the highly prized publications of the presses of the Bradfords, Benjamin Franklin, Isaiah, and Thomas; very many different works of Increase and Cotton Mather, printed at Cambridge and Boston from 1671 to 1735; a perfect copy of that rarest of American books, Eliot's Indian Bible, and a collection showing the progress of the art of printing from its infancy.

GEN. WASHINGTON'S JOURNALS.

Valuable manuscripts are preserved, also, including two autograph journals of George Washington. One of these is dated 1775, during Braddock's expedition, and one in 1787, written at Mount Vernon. Two volumes of an original military journal of Major General Greene, 1781-'82; twelve folio volumes of the papers of Paul Jones while he commanded American cruisers, 1776-'78; a private journal left by Arthur Lee while minister to France in 1776-'77; a collection of orderly books of the revolution, and more than two score of volumes of autographs of great rarity and interest.

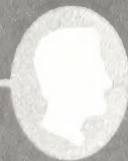
Not least interesting are a number of illustrated works and collections of engravings, which embrace choice reproductions of the art treasures of the old world.

Bound copies of the periodicals of all nations, and embracing complete series of the leading magazines of Great Britain and the United States for many years past, are among the sacred things touched by the finger of time.

In the law library of Congress are to be found every volume of English, Irish and Scotch, as well as American reports, a prolific and never-failing fountain of knowledge from which the barrister may draw inspiration. It is understood, also, that the library contains a complete collection of the statutes of all civilized governments, including those of Russia since 1649, the latter of which fill about 100 quarto volumes.

RARE BOOKS OF REFERENCE.

Classed with the curiosities there found are the first edition of Blackstone's Commentaries and an original edition of the report of the trial of Cagliostro, Rohan and La Motte for the theft of Marie Antoinette's diamond necklace.



THE LINCOLN NATIONAL LIFE FOUNDATION

FORT WAYNE, INDIANA

MOTIVE POWER OF THE WIND

"Of all the forces of nature, I should think the wind contains the largest amount of motive power--that is, power to move things. Take any given space of the earth's surface--for instance, Illinois; and all the power exerted by all the men, and beasts, and running-water, and steam, over and upon it, shall not equal the one hundredth part of what is exerted by the blowing of the wind over and upon the same space. And yet it has not, so far in the world's history, become proportionably valuable as a motive power. It is applied extensively, and advantageously, to sail-vessels in navigation. Add to this a few wind-mills, and pumps, and you have about all. That, as yet, no very successful mode of controlling, and directing the wind has been discovered; and that, naturally, it moves by fits and starts--now so gently as to scarcely stir a leaf, and now so roughly as to level a forest--doubtless have been the insurmountable difficulties. As yet, the wind is an untamed, and unharnessed force; and quite possibly one of the greatest discoveries hereafter to be made, will be the taming and harnessing of it. That the difficulties of controlling this power are very great is quite evident by the fact that they have already been perceived, and struggled with more than three thousand years; for that power was applied to sail-vessels, at least as early as the time of the prophet Isaiah."

Fragment from Abraham Lincoln's
Lecture on "Discoveries and Inventions"

Abe Lincoln's Patented Idea Used On LST

**Adjustable Pontoon
For Steamboats
Failed Commercially**

By Science Service

WASHINGTON, Feb. 12—Abraham Lincoln's invention of adjustable pontoons for steamboats was a commercial flop, but a modified version of the principle was used on World War II's hard-hitting LSTs.

Mr. Lincoln's invention, granted number 6,469 by the U.S. Patent Office in 1849, described adjustable air chambers that were carried on the sides of vessels. The chambers could be lowered into shallow waters to give extra buoyancy to the boats and thus help them across sand bars.

Idea For Patent

The same effect was achieved on LSTs by water-filled ballast tanks carried fore and aft inside the ship. Water could be pumped out of the tanks and the bow raised from a normal depth of eight feet to a depth of two and a half feet. The stern could be raised from 14½ feet to nine feet.

Just why Mr. Lincoln's patent never caught on commercially is hard to say. It probably did not work.

U.S. Coast Guard Lieut. R. J. Theobald said Mr. Lincoln may have got the idea for his patent while working as a rail-splitting laborer during the flood season in Illinois. Heavy rains washed away the banks of the Illinois and Sangamon rivers, depositing silt in the shallow river bottoms. This made treacherous navigation even more hazardous.

Not Much Of Problem

Mr. Lincoln suggested the river banks be "cribbed" with wooden rails to prevent their washing away. His idea was accepted and tried out. Mr. Lincoln was employed to help split the rails.

Nowadays, 30-foot river channels permit boats to sail far inland. Shoals are not much of a problem. But if a boat must cross a sand bar, it sometimes can get up enough speed in advance to slither across.

If the ship runs aground, high tide may release it. If that fails, other boats can pull the unfortunate vessel off the sand bar.

Trial and Error

ABRAHAM LINCOLN was the only president of the United States who ever got an invention patented. He invented a boat that could be floated over a shoal when it got stuck, by blowing up bellows fastened to the hull below the water line. So far as we know the invention was never put to use, but Lincoln paid thirty dollars for it and a model is in the National Museum. For the ten years before he went to the White House Lincoln was deeply interested in science and in 1858 he gave two lectures on Discoveries and Inventions.

That was eighty years ago and the stream of invention flows on undiminished. A sampling was recently made by the New York Times from the 774 patents granted in a single week. Here are some of the new tricks:

Perfumed paint that smells nice while it is drying.

An automatic awning that lowers itself when the rain begins and raises itself when the rain stops.

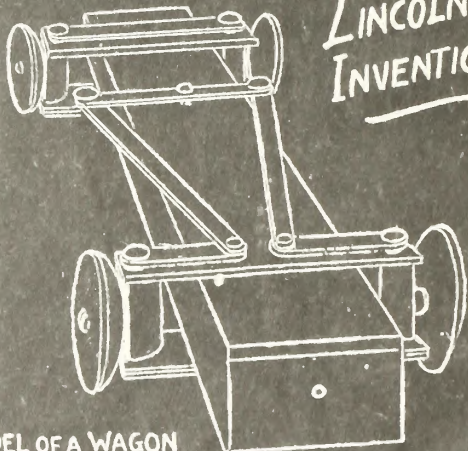
A bathroom mirror that won't get blurred by steam.

An "electric chair" for killing chickens by electrocution instead of decapitation.

A garter to keep a cow from switching her tail in your face while you milk.

So from gadget to gadget runs the irrepressible mind of the Yankee. Which of these devices you'll ever be able to buy in the shops is another matter. The vast majority of inventions are never developed at all. Yet the failures play their peculiar part in the drama of progress. The human race learns not only by triumph but also by disappointment. We even have a standard phrase for it—"trial and error." Lincoln himself urged that scientists ought to publish their failures as well as their successful experiments. "Too often," he said, "we read only of successful experiments in science and philosophy, whereas, if the history of failure and defeat was included there would be a saving of brainwork as well as time."

LINCOLN'S INVENTION



MODEL OF A WAGON

MADE BY ABRAHAM LINCOLN IN 1840

Notice - the Front Wheels move instead of the Axle
A Forerunner of the modern Automobile

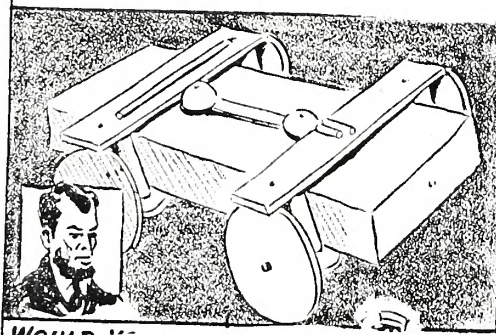
LINCOLN WAGON

Replica of a wagon whittled out by Abe Lincoln about 1850. The front wheels move but not on the axle. It is the forerunner of modern automobile construction, wherein the same principle is embodied.

Search of the patent office reveals no application for patent was ever filed.

From the Collection of Carl W. Schaefer





A. LINCOLN, INVENTOR
TRANSPORTATION WAS
ABRAHAM LINCOLN'S SOLE
IDEA IN DESIGNING THIS
MODEL CAR ALMOST
100 YEARS AGO. BUT
TODAY'S CARS, WITH
MOHAIR VELVET
UPHOLSTERED
INTERIORS,
PROVIDE
TRANSPORTATION
PLUS COMFORT
AND BEAUTY.

Queer-Looking Device.

The model is a miniature wooden boat about 2 feet long. Lincoln's queer-looking device on the sides was supposed to provide additional buoyancy for a boat in shallow water, thus permitting the vessel to navigate safely over dangerous shoals.

The device consisted of two expandable chambers running lengthwise on either side of the boat. Lincoln thought the chambers could be pumped full of air when shallow water was reached, forcing the chambers down into the water and lifting the vessel up.

Whether the contraption ever was actually fitted to a boat, or whether it would work if so fitted, is not known, but Lincoln managed to get a patent any way. Mr. Wilson believes Lincoln himself might have whittled out the model, since he was quite proficient in handling a jackknife. The model, in an excellent state of preservation, is well constructed, but not highly finished.

In Own Handwriting.

Lincoln's original application for the patent, in his own handwriting, is one of the highly-prized possessions of the Patent Office, which on April 10 celebrates the 150th anniversary of President George Washington's signing of the first patent act. Mr. Wilson's visit with Mr. Coe, of course, was prompted by Lincoln's 131st birthday anniversary, which is tomorrow.

Historians generally agree that Lincoln first saw the need for some kind of a device that would enable a boat to navigate in shallow water while engaged as a hand on flat boats, which were a vital part of the transportation system before the full development of railroads.

Mr. Wilson, an ardent collector

of Lincolnia, recalled this saying attributed to the then 40-year-old would-be inventor:

"With this invention I could float a flat boat in a heavy dew."

Abraham Lincoln's Airship

BY HARRIET PRESCOTT SPOFFORD

Drawing by S.J. Woolf



ONE would never think of Abraham Lincoln as the inventor of an airship; but indeed he seems to have been the inventor not only of an airship but of the first hydroaeroplane.

Seeing one of the airships, that occupy so large a space in the world just now, rise on its great wings and sound its enormous whir, I am reminded of a ship invented by Abraham Lincoln with which air had a great deal to do, and the idea of which was so original that I think it might interest any person with a mechanical talent.

One May evening in Washington,—and a May evening in Washington is apt to be a delightful thing,—my old friend, Mr. Zenas C. Robbins, was sitting with his wife and reading aloud, when Mr. Elihu B. Washburne called. Mr. Washburne was not then the personage he afterwards became as Secretary of State and as Minister to France, where, after a fashion our Ministers have, he was the only foreign Minister remaining in Paris during the siege. He came that evening to introduce his friend, Abraham Lincoln, to a delightful family. This was in the year 1849.

As Mr. Robbins had lived ten years in St. Louis, and was well acquainted with a great portion of Illinois, there was much to talk about. I can imagine that Mr. Lincoln made the evening lively with many a story of the regions familiar to them both. They had common ground also in their sympathy with the oppressed, and in the questions that later convulsed the country.

Mr. Robbins did not see anything awkward or uncouth in his visitor; he was too much engaged in observing his frank and friendly demeanor and his cordial address. "I distinctly remember Mr. Lincoln's eyes," said Mr. Robbins. "They were in color a clear dark hazel; and more beautiful eyes never looked out of a human face. Their varying expressions were those of gentleness, kindness, honesty, sagacity, manliness, and an open-hearted confidence that inspired confidence in return."

A few days after this beginning of acquaintance Mr. Lincoln came into the office of Mr. Robbins,—who was an attorney and solicitor of patents,—with the model of a steamboat under his arm. It was a boat of the flat-bottomed type used on the western and southern rivers. He placed the model on Mr. Robbins' table, and proceeded to explain the principles it embodied, and on which he desired to take out "letters patent," "if," he said, with his accustomed modesty of manner which would never have led you to believe he was really in many ways the greatest man of his generation, "it may be found that those principles are new."

Fortunately, Mr. Robbins, owing to his long residence on the banks of the Mississippi, was familiar with everything pertaining to the construction and equipment of the flat-bottomed craft used on the great streams of shifting shoals and sand bars, and he was able to come speedily to the conclusion that the principles in question were not only new and patentable but excellent and to be desired.

The boat was certainly interesting. Its first

noticeable feature was the broad guards that unlike the guards of the boats of eastern waters extended the whole length of the hull of the boat. Secured to the underside of these guards by very strong and suitable clamps and other fastenings was a series of expansible buoyant chambers, made of exceedingly tough and all but indestructible material, elastic and waterproof. A row of uprights rose from these buoyant chambers which by means of the proper machinery were connected with the boat's engines, so that when in shallow waters, if she should run aground, the whole power of the engines could be so exerted as to expand these buoyant chambers and lift the boat clear of all obstruction, the increased buoyancy allowing her of course to float till deeper currents were reached. Then by transferring the power of the engines to the wheels the boat could be driven forward again to its desired port.

"I think," said Mr. Lincoln laughingly, after he had finished explaining and exploiting his invention, "that my improved steamboat can be run wherever it is a little damp."

Although a patent, covering all the distinguishing features of the invention, was procured, no effort seems to have been made to test the practical value of the boat. But Mr. Robbins thought the invention was almost prophetic of the way in which, not a score of years afterwards, Mr. Lincoln was to upbraid the Ship of State over treacherous waters and through channels commanded on either shore by masked batteries and sharpshooters.

The identical model that Mr. Lincoln brought to the lawyer's office that May morning may be seen today in the United States Patent Office, unless the Government should have removed the models to other quarters.

Lincoln's Interest in Inventions Is Recalled by Patent Society

In Early Talk to College Students He Credited Adam's Fig-Leaf Apron With Being World's First Important Discovery

Special to THE NEW YORK TIMES.

WASHINGTON, Jan. 1.—The first and most nearly perfect "World's Fair" was held in the Garden of Eden, according to Abraham Lincoln, an article in the January issue of The Journal of the Patent Office Society will say.

The article, which discloses the roles of science, invention and patents in Lincoln's life, brings to light two lectures on "Discoveries and Inventions" delivered by him in early 1858; one before the students of Illinois College and the other before the Springfield Library Association.

Man's first important discovery, Lincoln told his listeners, was the fact that he was naked, "and his first invention was the fig-leaf apron. This simple article, the apron, made of leaves, seems to have been the origin of clothing—the one thing for which nearly half of the toil and care of the human race has ever since been expended."

In his lectures Lincoln reveals how discoveries, inventions and improvements have lifted man from the crude and primitive existence of the animal.

"Man is not the only animal who labors," he said, "but he is the only one who improves his workmanship. This improvement he effects by discoveries and invention."

Only Presidential Patentee

Lincoln himself was an inventor and received a patent in 1849, the Journal article recalls. He is thus the only patentee President in United States history.

The invention was for a boat that would buoy itself over shallow waters should it become stuck. The inspiration came to Lincoln while he was returning home after his first session in Congress, by boat via Niagara Falls and the Great Lakes. Along the way the vessel stranded on a sandbar and was successfully floated only when the captain ordered loose planks, empty barrels and boxes under the side of the boat. Lincoln, a careful observer of the proceedings, noticed how the empty casks buoyed up and swung the boat clear of the sandbar.

As soon as he arrived home, Lincoln went to a mechanic named Davis, who had a shop a few doors from his law office. With Davis's help and tools, he whittled out a model. The boat had a kind of bellows on each side of the hull below the water-line. By a system of ropes and pulleys, whenever the vessel stuck on the sand, the bellows were to be filled with air. The air would buoy up the boat, thus floating it clear of the shoal. On May 22, 1849, Lincoln received a patent for his invention.

Lincoln paid a fee of \$30 for his patent, but his invention was never used in commercial navigation. The model is on display in the National Museum in Washington.

Lincoln regarded the founding of the patent system as one of the three great inventions and discoveries in the world's history. He placed it after the art of writing and of printing and the discovery of America.

Failed as Lawyer in Patent Case

Lincoln, the lawyer, the Journal article sets forth, was retained as counsel in at least five suits involving patents. One of these cases involved two of the McCormick reaper patents.

During the hearing Lincoln met the polished lawyers from the East, the chief and managing counsel on his side of the case, Edwin M. Stanton whom he was later to appoint his Secretary of War, and George Harding. They handled him "rather roughly" and in the end manoeuvred him into a position where he was only to stand by as a silent watcher in the courtroom, although he had thoroughly prepared to argue the case for the defense, that is, against McCormick.

After the trial, deeply humiliated by the treatment he received from Harding and Stanton, Lincoln left for home resolved "to study law" and improve himself so that he would be ready for "these college bred fellows" when they reached Illinois.

So impressed was Lincoln with the brilliant speech that Stanton made at the trial that it influenced him years later in choosing Stanton as his final Secretary of War.

The Journal article also tells of Lincoln's deep interest in science. One day his law partner, Herndon, brought to the office a copy of a scientific publication called the Annual of Scientific Discovery. Soon Lincoln was lost in the volume and when he had finished told Herndon:

"I have wanted such a book for years, because I sometimes make experiments and have thoughts about the physical world that I do not know to be true or false."

By studying the works of scientists and by taking advantage of their brains, toil and knowledge, Lincoln saw where man could avoid errors and improve his environment. Scientists should not only publish their successful experiments, but also their failures, he felt.

"Too often," Lincoln told Herndon, "we read only of successful experiments in science and philosophy, whereas, if the history of failure and defeat was included there would be a saving of brainwork as well as time."

